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Vol. 35
No. 5
Whole
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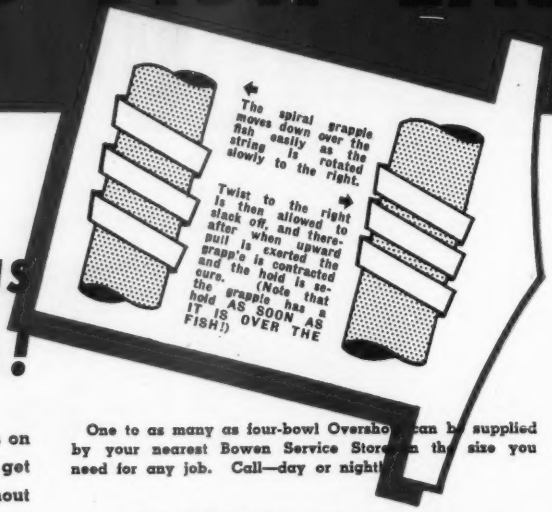
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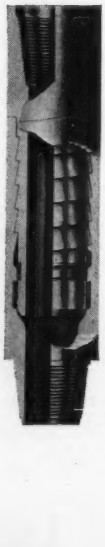

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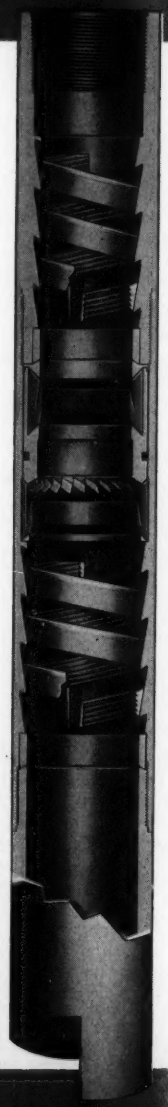

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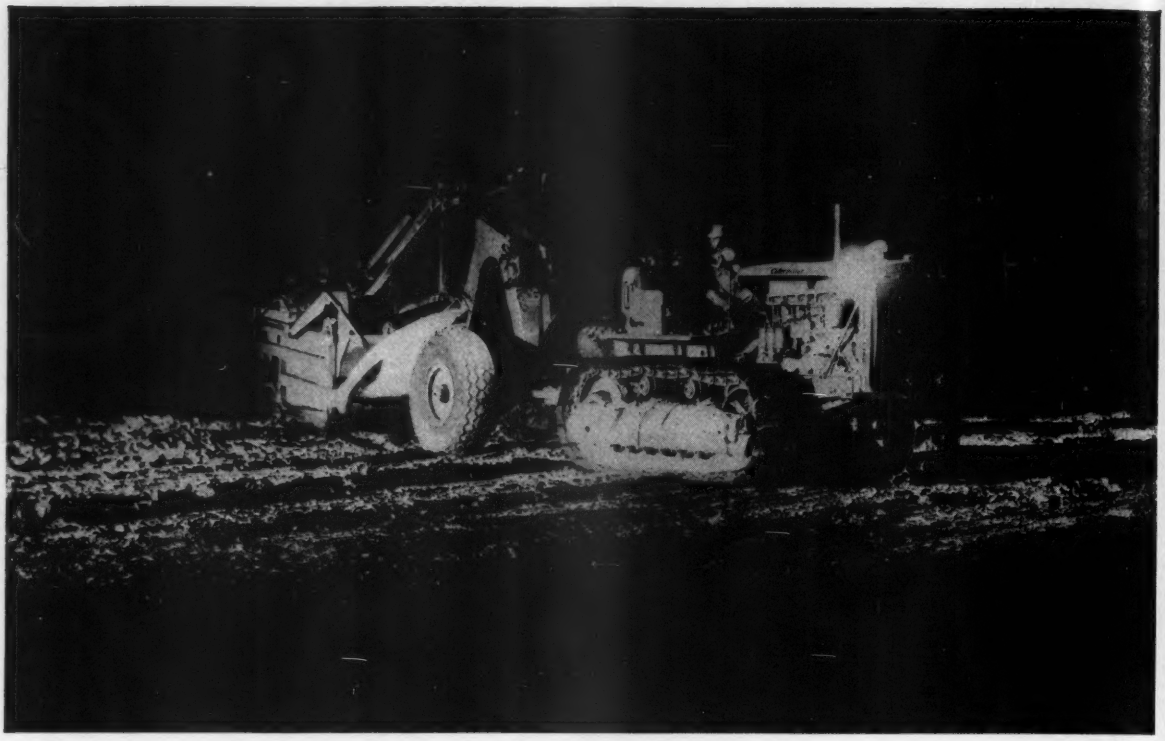

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The Viscosity of Crude Oil Emulsions

Determined by New Tool

A. P. I. Paper, Spring Meeting
Pacific Coast

By Wm. Woelflin
Petroleum Rectifying Co. of California

ABSTRACT

A funnel type viscosimeter suitable for determining viscosities of brine-in-oil emulsions was developed and calibrated against the Saybolt Universal viscosimeter. Viscosities were determined on "loose", "medium" and tight emulsions. The viscosities were largely dependent on the amount of brine in the emulsion, and to a lesser extent on the particle size and age of the emulsion.

The results of the viscosity tests were expressed as the "Viscosity Ratio"; that is, the ratio of the viscosity of the emulsion at any temperature, to the viscosity of the clean oil at the same temperature.

The viscosity ratio at 75°F. for a medium emulsion was 1.34 for 10% brine, in the emulsion; 1.88 for 20%; 4.25 for 40%; 15.0 for 60%; and 46.5 at 70% brine. The ratios were the same for elevated temperature.

When the clean oil viscosity is known, the viscosity ratio can be used to determine the viscosity of the wet oil. This information is useful in engineering work, since the wet oil viscosity is of importance in designing gathering systems, and in choosing pumps and tubing sizes for wet wells.

There is an inversion of phase from brine-in-oil to oil-in-brine usually in the range from 70% to 85% brine content. After the inversion the viscosity approaches that of the brine. From viscosity considerations the emulsions should be handled with either a very low, or very high brine content. The practical difficulties of the latter are obvious because of the necessity of handling large volumes of fluid with relatively small volumes of oil.

There is little information in the literature regarding the viscosities of crude oil emulsions. Almost all oil company laboratories are equipped to determine clean oil viscosities and these data are usually available. Data will be presented in this paper which will enable the viscosity of a brine-in-oil type of emulsion to be estimated from the clean oil viscosity. These latter data are of considerable importance in designing field gathering systems and lines that handle wet oil. Many wells produce an emulsion and the viscosity of the emulsion will influence directly pumping pressures and tubing sizes.

An emulsion is a system containing two liquid phases, one of which is dispersed as globules in the other. With the two liquids, oil and brine, two types of emulsion are possible, one in which the oil is dispersed in the brine and the second in which brine is dispersed in the oil. Almost all emulsions encountered in the oil fields are the latter type; that is, emulsions in which brine is dispersed in the oil. Brine is therefore the dispersed, or internal phase, and the oil is the dispersing or external phase. When considering emulsions in this paper it will be of the brine-in-oil type unless otherwise specified.

The viscosity of a liquid is a measure of the internal fluid friction in that liquid; that is, the resistance to shear, agitation or flow. In addition to the viscosity of the dispersing phase, the viscosity of an emulsion is complicated by the presence of the dispersed brine particles in the continuous oil phase.

There are several mathematical formulas for calculating the viscosity of an emulsion, notably the equa-

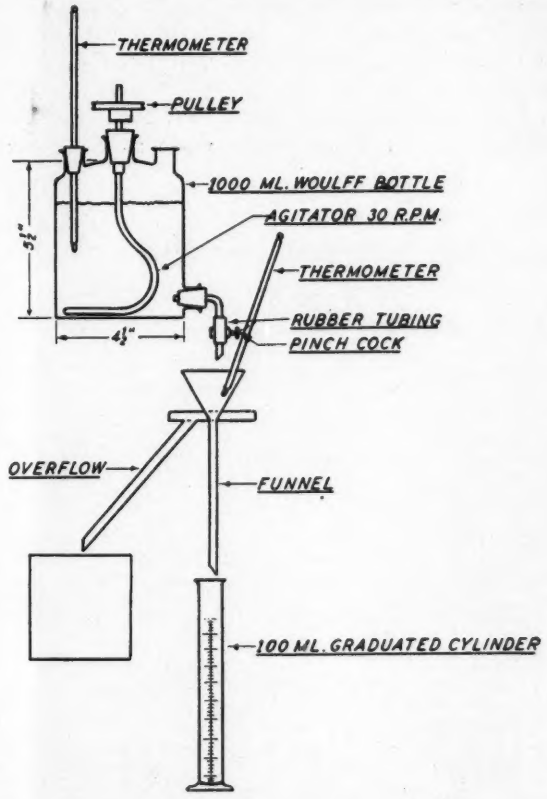

FIGURE I

APPARATUS FOR DETERMINING VISCOSITIES OF CRUDE OIL EMULSIONS			
SCALE:- 1/4 SIZE			
REFERENCE			
PETROLEUM RECTIFYING COMPANY OF CALIFORNIA 530 WEST SIXTH STREET, LOS ANGELES, CALIFORNIA			
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tion developed by Einstein and modified by Smoluchowski. There is another by Hatschek. None of these equations is applicable over as wide a range of condition as found in oil field emulsions.

Recently L. T. Monson[1] presented the results of experiments to determine the viscosity of brine-in-oil emulsions. At that time Monson in order to express his results, introduced the "viscosity ratio", which is the ratio of the viscosity of the emulsion at any temperature to the viscosity of the clean oil at the same temperature. The "viscosity ratio" is also used to express results in this paper.

The previous work by Monson consisted of viscosity determinations on brine-in-oil emulsions that were of extremely small particle size. The results reported herein are from determinations on emulsions of both large and small particle size which are more comparable to those emulsions met in practice. It was found that the Saybolt viscosimeter was not suitable to determine viscosities on the relatively loose or large particle size emulsions because of the small bore of the tube, since some of the brine particles may plate out on the side of the tube and may lead to quite large errors in the determination. Another difficulty with the Saybolt viscosimeter was the settling of large particles during tests which would coalesce to a layer of brine in the bottom of the Saybolt reservoir.

The apparatus that was developed to determine these viscosities consisted of a 2½", 60° glass funnel with a stem length of 6". The reservoir that held the emulsion contained a paddle for stirring and thereby maintained a uniform mixture flowing through the funnel. An overflow tube was placed in a catch-all below the funnel to drain off excess emulsions. All the tests made with the funnel viscosimeter were made at room temperature. However, the equipment could be surrounded by a water jacket and used in making determinations at elevated temperatures.

The upper vessel was filled with the emulsion to be tested and agitation was started. After the oil had been allowed to reach equilibrium at room temperature the test procedure consisted in allowing the oil to flow through the filling tube and through the funnel. The pinch-clamp was adjusted so that the funnel, which was held level, was kept full and slightly overflowing at all times. The efflux time was measured as the time required for 100 ml. of sample to flow through the funnel. The temperature was measured by a thermometer suspended in the funnel chamber. This method of viscosity determination gave reproducible results, efflux times sufficiently large to be accurate, but not so long as to introduce the possibility of temperature variations during the test. There was no uneven flow because of separation of the phases of the emulsion, or no plating out of brine on the inside of the

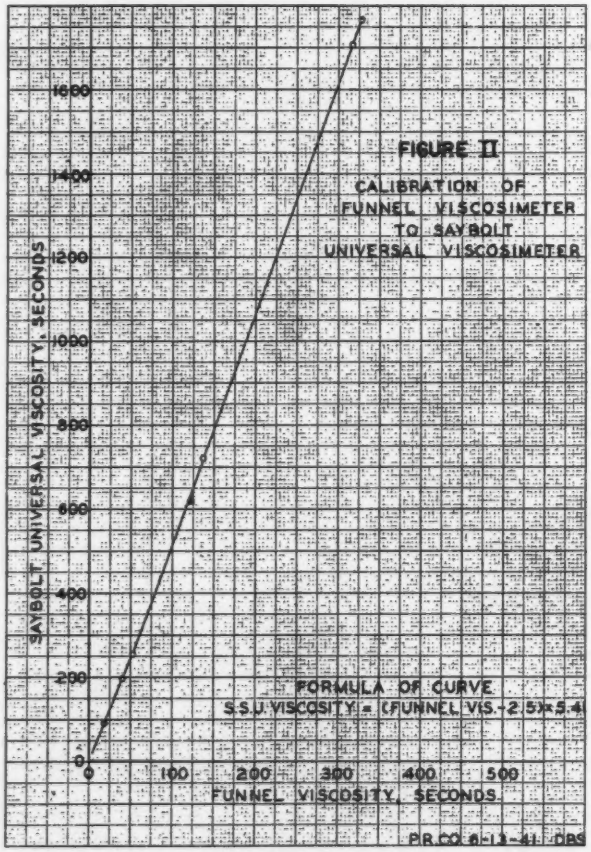
FIGURE II
CALIBRATION OF FUNNEL VISCOSIMETER TO SAYBOLT UNIVERSAL VISCOSIMETER
SAYBOLT UNIVERSAL VISCOSITY, SECONDS
FUNNEL VISCOSITY, SECONDS
FORMULA OF CURVE
S.S.U. VISCOSITY = (FUNNEL VIS.+2.5)×5.4
P.R.CO. 8-13-41 DBS

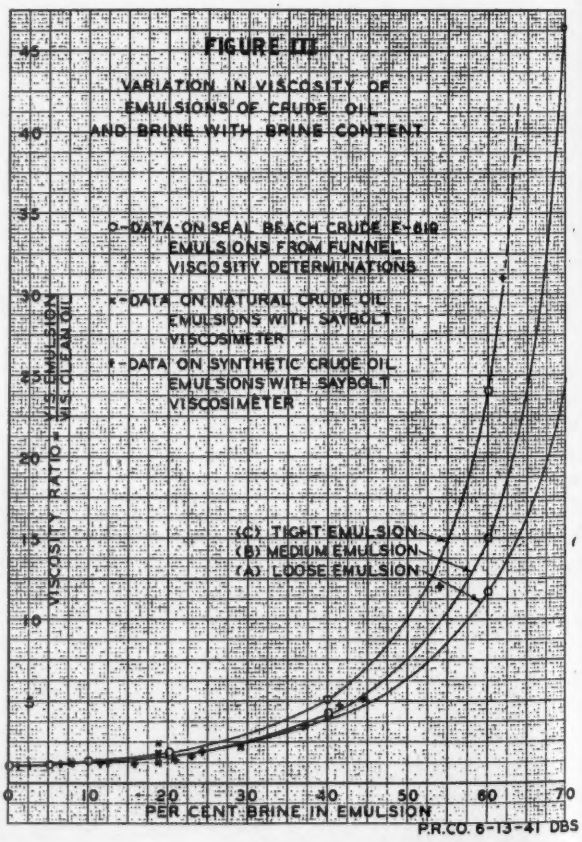
FIGURE III
VARIATION IN VISCOSITY OF EMULSIONS OF CRUDE OIL AND BRINE WITH BRINE CONTENT
o-DATA ON SEAL BEACH CRUDE E-618 EMULSIONS FROM FUNNEL VISCOSITY DETERMINATIONS
×-DATA ON NATURAL CRUDE OIL EMULSIONS WITH SAYBOLT VISCOSIMETER
•-DATA ON SYNTHETIC CRUDE OIL EMULSIONS WITH SAYBOLT VISCOSIMETER
(C) TIGHT EMULSION
(B) MEDIUM EMULSION
(A) LOOSE EMULSION
VISCOSITY RATIO = VIS. EMULSION / VIS. CLEAN OIL
PER CENT BRINE IN EMULSION
P.R.CO. 6-13-41 DBS

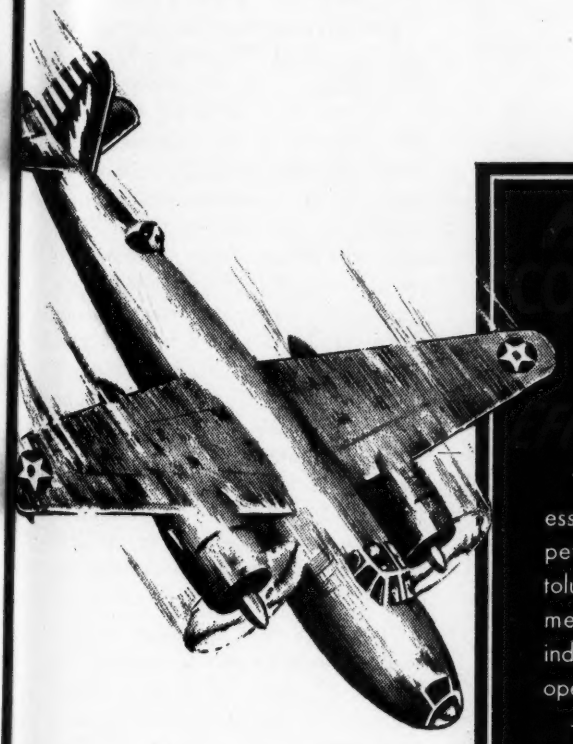

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TABLE 1.
Calibration of Funnel Viscosimeter

Material	Viscosity by Saybolt Univ. Viscosimeter, Seconds	At Temp. °F.	Viscosity by Funnel Viscosimeter, Seconds	At Temp. °F.
E-448 Crude, 16.2°API	10135	72	1877	72
Glycerine	1740	70	327.5	69.5
E- 24 Crude, 25.1°API	701	70	137	69.5
E-619 Crude, 25.1°API	255	70.5	50	71
E-619 Crude, 25.3°API	202	75	38	77.5
Transformer oil	90	70	18.4	70
Water	30.5	70	7	67

TABLE 2.
Characteristics of Emulsions

Type	Appearance of Cut
Tight emulsion	All emulsion
Medium emulsion	80% emulsion, 20% brine
Loose emulsion	30% emulsion, 70% brine

funnel during any of the tests.

For comparison with other work it was necessary to correlate efflux times obtained on the funnel viscosimeter with Saybolt Universal seconds. Several viscosity determinations were carried out by both methods on transformer oil, glycerine and on samples of E-24 (Goose Creek, Texas) dry crude, E-448 (Mt. Poso, Calif.) crude and E-619 (Seal Beach, Calif.) dehydrated crude. The test data, which are outlined in Table 1, when corrected to the same temperature for each series of determinations give a correlation curve for converting funnel viscosity to Saybolt Universal viscosity, which is presented in Figure 1.

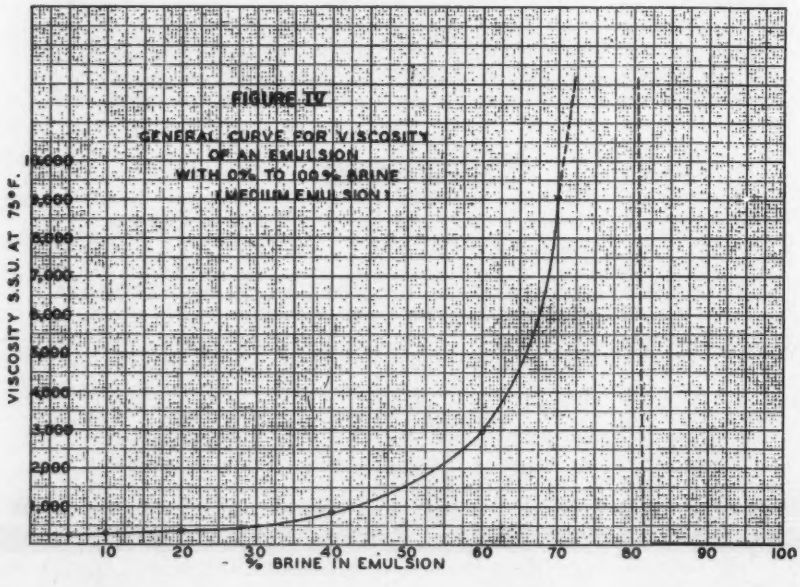
After correcting the observed viscosities to the same temperature by means of the ASTM viscosity-temperature chart, the curve for Saybolt viscosity vs. funnel viscosity is a straight line as shown in Figure II with the formula:

Saybolt viscosity=

(funnel vis.-2.5) x 5.41

Effect of Time

The time that elapses between the formation of the emulsion and the determination of its viscosity will effect the results obtained. In general aging will increase the viscosity, especially of medium and loose emulsions. The effect is relatively small, and actual measurements to determine this effect were not made. However, all samples were aged 15 minutes before testing in order to make results comparable.



Effect of Particle Size

The effect of particle size on the viscosity of an emulsion is larger in the higher range of brine content and tests were made to determine the viscosity of emulsions having loose, medium and tight characteristics. This nomenclature is only qualitative and centrifuge tests were used to determine the approximate particle size rather than photo-micrographs since centrifuge tests are more suitable for field use. A centrifuge cut was made on each emulsion by mixing 25 ml. of the emulsion with 75 ml. of gasoline-carbon-disulphide and centrifuging for 10 minutes at room temperature at a speed of 1400 rmp. The emulsification was controlled in order to give emulsions of approximately the following characteristics by centrifuge.

Emulsions with different degrees of emulsification occur in the production of crude oil, and therefore emulsions of different characteristics were used in these tests. "Tight" emulsions are those of extremely small particle size, and usually occur when a wet well is flowing with a high gas-oil ratio and is subjected to extreme conditions of agitation. A cut made on an emulsion produced under these conditions would show all emulsion. A "loose" emulsion is one which normally occurs in the production from a pumping well in which mechanical equipment is in good condition. About 30 per cent of the material centrifuged out when making a cut will consist of emulsion and about 70 percent will be brine. A "medium" emulsion is between a "tight" and "loose" emulsion, and may occur under various conditions such as a pump in poor condition or leaky tubing, or gas coming through the tubing with the wet oil. In this case about 80 per cent of the cut will be emulsion and 20 per cent will be brine.

The effect of the particle size is shown in Figure III together with the effect of the amount of brine.

The Effect of Brine Content

Since it was impossible to obtain natural occurring emulsion of varying particle size which also contain-

TABLE 3.
Test Data on Loose Emulsion

Percent Brine Added / Observed Cut on Emulsion	5%	10%	20%	40%	60%
Emulsion %	1.4	2.9	10.0	14.0	22.0
Water %	3.7	7.7	12.0	26.8	45.6
Total %	5.1	10.6	22.0	40.8	67.6
Temperature of test °F.	73.5	73.5	72.5	71	70
Observed funnel viscosity, secs.	53	61	85	201	597
Calculated Saybolt viscosity, secs.	270	314	440	1070	3220
Calculated Saybolt viscosity, at 75° F., secs.	261	301	410	915	2610
Viscosity ratio at 75° F., calculated	1.16	1.34	1.82	4.06	11.6

TABLE 4.
Test Data on Medium Emulsions

Percent Brine Added / Observed Cut on Emulsion	5%	10%	20%	40%	60%	70%
Emulsion %	5.2	8.4	21.0	37.0	55.0	60.0
Water %	1.2	2.0	2.0	8.0	13.0	15.0
Total %	6.4	10.4	23.0	45.0	68.0	75.0
Temperature of test °F.	79.8	79.8	72.5	78.4	75.5	80.2
Observed funnel viscosity, secs.	41.2	46.5	75.5	140	525	1305
Calculated Saybolt viscosity, secs.	209	239	395	736	2840	7060
Calculated Saybolt viscosity, at 75° F., secs.	323	262	367	830	2920	9050
Viscosity ratio at 75° F., calculated	1.19	1.34	1.88	4.25	15.0	46.5

TABLE 5.
Test Data on Tight Emulsions

Observed Cut on Emulsion / Percent Brine Added	5%	10%	20%	40%	60%	70%
Emulsion %	6.4	12.0	28.0	60.0	92.0	160.0
Water %	.	.	.	.	.	.
Total %	6.4	12.0	28.0	60.0	92.0	106.0
Temperature of test °F.	80	82.2	73	77	74.7	
Observed funnel viscosity, secs.	40	43.5	75	173	880	inf.
Calculated Saybolt viscosity, secs.	203	222	393	929	4750	.
Calculated Saybolt viscosity, at 75° F., secs.	235	264	372	990	4690	.
Viscosity ratio at 75° F., calculated	1.20	1.35	1.91	5.07	24.0	

ed a varying per cent of brine, it was necessary to make these emulsions by mixing the oil and brine intimately in a piston type emulsifier. This emulsifier consisted of a cylinder with a loose fitting piston. The brine and oil were poured into the cylinder and agitated by moving the piston up and down rapidly by hand. Emulsions were made in this manner containing up to 70 per cent of brine. These emulsions were made from a Seal Beach crude with a gravity of 25.1° API at 60° F. and brine produced with this crude which had a specific gravity of 1.023 at 68° F. The viscosity characteristics of this crude were:

Viscosity S.S.U. at 70.5° F. 255
Viscosity S.S.U. at 100° F. 127
Viscosity S.S.U. at 119° F. 94
Viscosity, funnel at 71° F. 50

The viscosity determinations on the samples of emulsions prepared as described above are tabulated in the following tables 3, 4 and 5.

These data are shown in Figure III which gives the change in the viscosity of the emulsion for variations in brine content. Curve A on this sheet is the curve for loose emulsion, Curve B for medium emulsion and Curve C for tight emulsion.

The highest brine content in the tight emulsion curve is 60 per cent. A test was attempted with a brine content of 70 per cent but owing to the extremely high viscosity of the emulsion it would not flow through the viscosimeter and the test was abandoned. It was possible to determine the viscosity of the medium emulsion at 70 percent which was 46.5 times that of the clean oil. Difficulty was also encountered in trying to determine the viscosity of the loose emulsion with 70 per cent brine content because of stratification of the test sample. In other words, under the condition of the experiment it was not possible to hold 70 per cent brine uniformly dispersed in this emulsion.

There is little difference in the viscosity ratio for brine contents up to 30 per cent. Above this value the curves diverge and the effect of particle size becomes of importance.

Figure IV shows a generalized curve of the variation in relative viscosity with increase of brine content. With no brine present the viscosity is that of the clean oil. As the water content increases the viscosity increases gradually to about 40 per cent brine and then rather abruptly to about 70 per cent or 80 per cent. Generally there will be an inversion of phase in this region and the brine will become the external phase. The internal phase will be a brine-in-oil emulsion. In this case a so-called "double" emulsion is formed in which a brine-in-oil emulsion is dispersed as the internal phase to form an oil-in-brine emulsion. When an emulsion of this type flows into a production tank, the brine in the external phase settles rapidly leaving a normal brine-in-oil emulsion.

After inversion to the oil-in-brine type of emulsion the viscosity will drop to a point slightly higher than the viscosity of the brine and gradually decrease until we have the viscosity of 100 per cent brine. The point at which inversion from a brine-in-oil to an oil-in-brine emulsion takes place, depends on the character of oil, character of brine, kind and degree of emulsification. In general you may expect to reach this point at 70 per cent to 85 per cent brine content. However, in specific cases you may have an inversion at as low a brine content as 50 per cent and in other cases brine-in-oil emulsions are stable with as much as 95 per cent of brine dispersed in 5 per cent of oil. When approaching emulsions near the inversion point the viscosity becomes very high and emulsions at this point can be considered as plastic solids, especially if brine is very finely divided or a very tight emulsion. Very few determinations have been made on emulsions containing more than 60 per cent to 70 per cent brine because of the difficulties experienced when working with emulsions with these high brine contents.

From an inspection of Figure IV, it is apparent that emulsions should be pumped either with a low brine content as a brine-in-oil emulsion, or with an extremely high brine content as an oil-in-brine emulsion. The disadvantage from a practical standpoint in pumping oil-in-brine emul-

sions is the large volume of fluid that it is necessary to handle. This, however, is being done in at least one case where a low gravity wet crude is pumped cold through a line by injecting brine in the line with the wet oil to reduce the pressure at the pump.

Effect of Temperature

A few tests were made several years ago using a Saybolt viscosimeter to determine the effect of temperature on the viscosity of a low gravity crude oil emulsion, made from a crude oil with a gravity of 14.8° API. A low gravity crude was used to eliminate changes in viscosity due to evaporation of some of the light fractions from the crude. The emulsion formed was considered a loose emulsion. The data from these tests follows.

Monson determined the viscosity of emulsions at various temperatures and plotted the results on A. S. T. M. charts for Viscosity-Temperature relationship. The Viscosity-Temperature curve for an emulsion, as given by Monson, was a straight line and approximately parallel to the curve for the clean oil.

Conclusions

An apparatus was developed suitable for determining viscosities of crude oil emulsions, and calibrated against a Saybolt Universal viscosimeter.

The viscosity of an emulsion is largely dependent on the amount of brine in the emulsion, and to a lesser extent on the particle size, and age of the emulsion.

The viscosity ratio which is the ratio of the viscosity of the emulsion to the viscosity of the clean oil at a given temperature, can be used to estimate the viscosity of the emulsion for engineering work.

A general curve was given to show the change in viscosity of an emulsion from 0 per cent brine to 100 per cent brine. From a consideration of this curve it is apparent that crude oil emulsions should be pumped with either a low brine content, or an extremely high brine content in order to maintain low pumping pressures.

In closing I wish to acknowledge the help given me by members of the Petroleum Rectifying Company laboratory staff; especially to Lieutenant D. B. Smith now with the Chemical Warfare Service, and C. S. Stevens who made most of the tests under the direction of Mr. C. H. M. Roberts, Research Director; also to the Petroleum Rectifying Company of California for permission to publish these results.

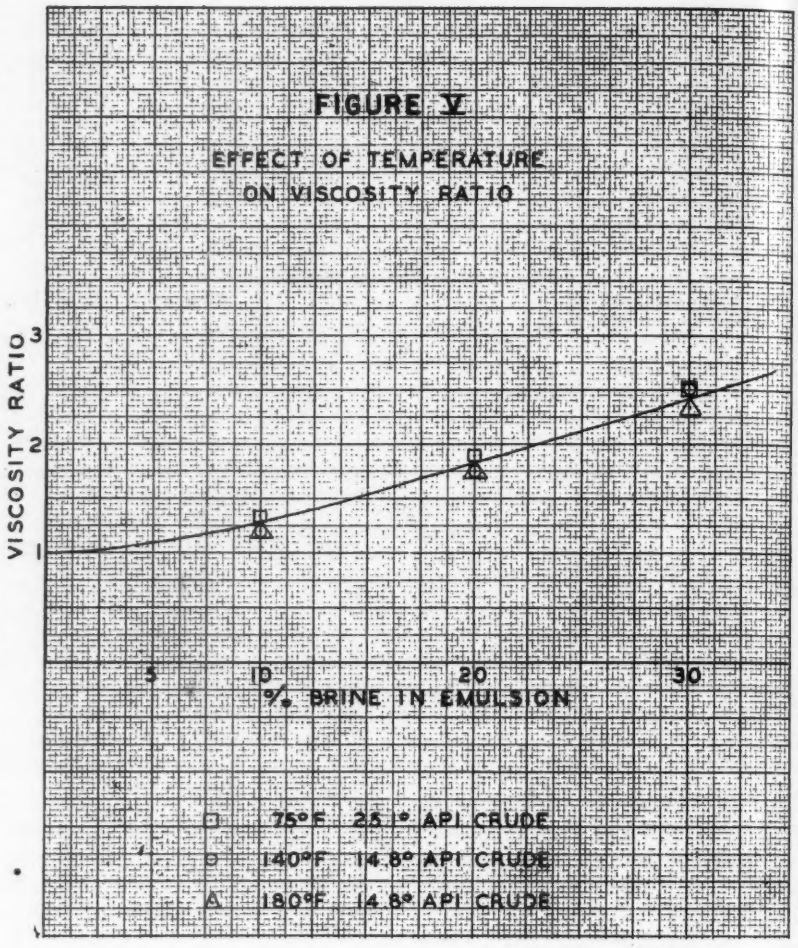


TABLE 6.
Viscosities at Elevated Temperatures

Brine Content	0%	10%	20%	30%
Temperature	180° F.	180° F.	180° F.	180° F.
Viscosity S. S. U.	170	210	295	395
Ratio		1.23	1.73	2.32
Temperature	140° F.	140° F.	140° F.	140° F.
Viscosity S. S. U.	470	580	825	1175
Ratio		1.23	1.75	2.50

These data are plotted on Figure V. together with the viscosity ratio of loose emulsion made from the 25° API oil made at 75° F.

Results of tests made at various temperatures on naturally occurring emulsions are given in Table 7. From the ratios given in Figure V. and also in Table 6 it is apparent that the viscosity ratio for a given brine content is independent of the temperature.

TABLE 7.
Viscosities of Natural Emulsions

Source	Kern Front	Round Mt.	Round Mt.
°API of Crude	15.8°	14.6°	16.3°
Brine %	9.0%	18.0%	20.0%
120° F. Viscosity Ratio	1.22	1.55	1.50
140° F. Viscosity Ratio	1.22	1.60	1.63
160° F. Viscosity Ratio	1.23	1.58	1.63

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1 Louis T. Monson, Ind. and Eng. Chem. **30,** 1287 (1938).

The Functions of the Natural Gas and

Natural Gasoline Industry Com. District 5

By Wm. Moeller, Jr., Chairman

Recognizing that it is imperative that there shall be maintained adequate supplies of natural gas, natural gasoline and liquefied petroleum gases to meet the constantly expanding demands of the Defense Program and essential civilian needs, and to insure that these products are utilized in the current Defense Program to the utmost limits of their potentialities, and, further, that the activities of the industries concerned with producing, manufacturing, transporting and selling these products be coordinated with the supreme National Defense effort, the Office of Petroleum Coordinator has established a Natural Gas and Natural Gasoline Section within the Office of Petroleum Coordinator. At Washington headquarters this section is presently in charge of Robert E. Allen, formerly Director of Production and now Assistant Deputy Petroleum Coordinator. His immediate assistant in natural gas and natural gasoline matters is Paul M. Raigorodsky.

For convenience of administration, the country is divided into five districts, the Pacific Coast area being included in District No. 5. In each of these districts the Petroleum Coordinator will have a chief in charge of the local or district office, and in addition the industry is represented by a Natural Gas and Natural Gasoline Industry Committee, reporting directly to the Petroleum Coordinator's Office at Washington.

The Chief of the Natural Gas and Natural Gasoline Office for District No. 5 has not yet been appointed, but it is anticipated that Kenyon Reynolds, formerly of the Pacific Gasoline Company, will be appointed to this position with Reed Garman, formerly of the Union Oil Company, as assistant.

The Industry Committee for District No. 5 is made up of the personnel as follows:

Wm. Moeller, Jr.

Wm. Moeller, Jr., Chairman, Southern California Gas Co.; George F. Schroeder, Standard Oil Co. of California; E. H. McCollough, Amerada Petroleum Corp.; A. F. Bridge, Southern Counties Gas Co.; W. G. Vincent, Pacific Gas & Electric Co.; H. L. Farrar, Coast Counties Gas Co.; R. H. Green, Signal Oil and Gas Co.; H. L. Eggleston, Gilmore Oil Co.; H. R. Linhoff, Richfield Oil Corp., and L. V. Cassaday, Lomita Gasoline Co.

The Chairman of the District Natural Gas and Natural Gasoline Committee will serve on and be a member along with the District Chairman of other industry committees; namely, Marketing, Transportation, Refining and Production to make up the District General Committee with Mr. A. L. Weil, formerly President of General Petroleum Corporation, as General Chairman.

The functional responsibilities of this industry committee will be to advise the Petroleum Coordinator with respect to action which it believes should be taken, or recommended by him in order to insure the maintenance of an adequate supply of natural gas and natural gasoline to meet Defense demands and for essential civilian uses. This committee is not to initiate action by itself or among the industry. It is really an advisory consultant to the Petroleum Coordinator with respect to the natural gas and natural gasoline industry in District No. 5.

Some of the problems which it is called upon to consider include the production of natural gas to insure the maintenance of an adequate supply and also to conserve to the fullest extent this invaluable natural resource. Much thought must be given to the best utilization of natural gas and natural gasoline both by processes, regions and industries. We must particularly stress the problem of the production and utilization of isopentane, butane and isobutane for the manufacture of aviation gasoline. We must maintain our transportation facilities at peaks of efficiency and devise plans to more efficiently use existing facilities.

In connection with this activity, the Office of Petroleum Coordinator for National Defense has issued Recommendation No. 25, which concerns the production of butane, isobutane and isopentane, a copy of which is presented here. Every one within the industry should give particular thought and attention to encourage and maintain the maximum operating efficiency of his plant. Wherever possible economies should be made in the use of fuel gas. Waste of any product should be eliminated.

In order for the Committee to have up-to-date information concerning the natural gasoline industry, it must obtain promptly certain current operating information. Some of this information is now available from the records maintained by the California Natural Gasoline Association. However, it is anticipated that additional information will be required and that a new monthly questionnaire will probably be prepared so that the Commit-

This paper presented before Taft Chapter of Calif. Nat. Gaso. Assn. meeting Feb. 19th. The substance of the talk was given before the C.N.G.A. February 5th monthly meeting by H. L. Eggleston, of Gilmore Oil Co., a member of Mr. Moeller's committee.

tee may be more fully informed. While no one likes to fill out questionnaires or be burdened with too much red tape, nevertheless, this cannot be avoided under the existing circumstances and the cooperation of every one in the industry is urgently requested, particularly that they submit as promptly as possible all information so requested. Information of this type is useful only if it is available promptly, and in view of anticipated changes in oil production procedure which will probably affect the production of casinghead gas in the various fields, it is absolutely essential that current information come to the Committee as promptly as possible in order that they may be fully informed as to the effect of certain changes which must be made.

Another important function of this Committee is to anticipate the needs for both natural gas and natural gasoline to meet current requirements, and such estimates can only be made intelligently if current information is available.

Office of Petroleum Coordinator For National Defense
Part 1512—Natural Gas and Natural Gasoline

Production of Certain Products Essential for Aviation Gasoline.

To the Natural Gas and Natural Gasoline Committees of the several Districts, to all persons, natural or artificial, who own or operate natural gasoline extraction plants, cycling plants, pressure maintenance plants or repressuring plants and to all persons who propose to construct such plants:

The successful prosecution of the nation's war effort requires that the production of all grades of aviation gasoline be increased to the maximum.

In order to assure maximum production of all grades of aviation gasoline, it is essential that there be maximum production of those products which are vital to the manufacture of aviation gasoline, viz; butane, isobutane and isopentane.

Existing and proposed natural gasoline extraction plants, cycling plants, pressure maintenance plants and repressuring plants are prime sources of butane, isobutane and isopentane and should be so constructed and operated as to facilitate the maximum production of aviation gasoline.

Therefore, pursuant to the President's letter of May 28, 1941, establishing the Office of Petroleum Coordinator for National Defense, I do hereby recommend that immediately and until further notice:

1512.1 **Survey to be made.** The Natural Gas and Natural Gasoline Committees for the several Districts shall obtain, compile and analyze all pertinent and available facts, figures and data with respect to the extraction, production, sale or disposition of butane, isobutane and isopentane by natural gasoline extraction plants, cycling plants, pressure maintenance plants and repressuring plants. Such survey should include, without limitation, information concerning the number, type and location of such plants, the present daily capacities of such plants and the possibilities of expansion thereof, the percentage and amount of butane, isobutane and isopentane extracted from the gas processed at such plants, the percentage and amount of butane, isobutane and isopentane saved and sold during the calendar year 1941 at or by such plants.

1512.2 **Terms of existing contracts to be filed.** Within 30 days from the date hereof each owner or operator of a natural gasoline extraction plant, cycling plant, pressure maintenance plant, or repressuring plant shall file in the Office of Petroleum Coordinator for National Defense a statement of the terms of existing contracts and agreements relating to the sale or other disposition of butane, isobutane, or isopentane either as free products or as they may be included in any other product.

1512.3 **Extraction and production at existing plants to be increased.** All persons, natural or artificial, presently owning or operating any natural gasoline extraction plant, cycling plant, pressure maintenance plant or repressuring plant shall increase the percentage of butane and isobutane extracted from the gas processed at such plant, or plants, to the maximum quantity economically possible and shall increase the production of butane and isobutane in liquid form at such plant, or plants, to the maximum quantity economically possible.

1512.4 **Construction of new plants.** All new natural gasoline extraction plants, cycling plants, pressure maintenance plants or repressuring plants shall be designed and constructed so as to make the most efficient use of scarce materials, to provide for the extraction of the maximum amount of butane and isobutane contained in the gas to be processed at such plants, and to assure the maximum production of butane and isobutane in liquid form at such plants.

R. K. DAVIES
Acting Petroleum Coordinator for National Defense.

1512.1 to 1512.4, inclusive, issued under the authority contained in the President's letter of May 28, 1941, to the Secretary of the Interior (6 F. R. 2760).

Tank Vehicles Petroleum Released

Acting on the recommendation of the Office of Defense Transportation, the WPB has authorized release of tank vehicles, including bodies, trailers and chassis, to be used in the transportation of petroleum products, which were frozen in the hands of manufacturers by the terms of limitation order L-1-C.

The freeing of railroad tank cars for essential long-haul use by the employment of trucks is illustrated dramatically in the case of short hauls made from one refinery on the eastern seaboard.

Deliveries to a shipbuilding yard one mile away tied up tank cars for four days. On this run, one 4,000-gallon truck will replace fifteen tank cars. On a fourteen-mile haul, eight 5,000-gallon trailers will replace seventy tank cars in a seven-day turn-around. On another run, five 6,000 gallon-tank trucks will replace fifty tank cars.

Some seventy-odd manufacturers of equipment for petroleum transportation were notified by telegram that they might release these products.

Engineering, Technology, latest news—twice a month in California Oil World.

Thermal Logging of Producing Oil Wells

By Clarence R. Dale
Technical Oil Tool Corporation, Ltd.

A. P. I. Paper, Spring Meeting
Pacific Coast

ABSTRACT

Interpretations of temperature anomalies observed and recorded in producing oil wells can be employed as an aid in solving problems such as locating the source of water, gas, and oil production, tracing the migration of fluids from one zone to another, and locating casing or tubing leaks. The temperature record must be taken when the well conditions are under careful control in order to develop the anomalies to recognizable proportions and to locate them. Normal geothermal gradients can often be used as a basis for interpretation, but when it is not available or cannot be relied upon a technique of making two successive temperature traverses, one while the well is flowing and the other with the well shut in, will permit accurate interpretation of the record. Six graphs and descriptions of problems involved in producing wells are shown.

* * *

Temperature phenomena observed in oil wells have been studied by a number of investigators for several years. In 1920 a paper dealing with geothermal data was published in the U. S. Geological Survey Bulletin[1]. The systematic application of temperature studies to the solution of problems in producing wells is, however, a comparatively new practice. In the past three years the published results of the use of interpretations of temperature anomalies in locating the source of water, gas, and oil production, determining the migration of fluids from one zone to another and locating casing leaks have considerably increased interest in this work. [2, 3]

It is well known that subsurface temperatures increase with depth. The geothermal gradient varies in different areas, and, in fact, may vary in different parts of the same structure. Also there is evidence to show that the geothermal gradient may not remain constant throughout the producing life of a field.

The normal geothermal gradient of a producing well is subject to change from a variety of conditions which may exist at points in the well. The anomalies recorded in a thermal log are indicative of these conditions. An interpretation of the log in the light of all other available information concerning the well shows the nature of the conditions and suggests the remedy or manner of taking advantage of them.

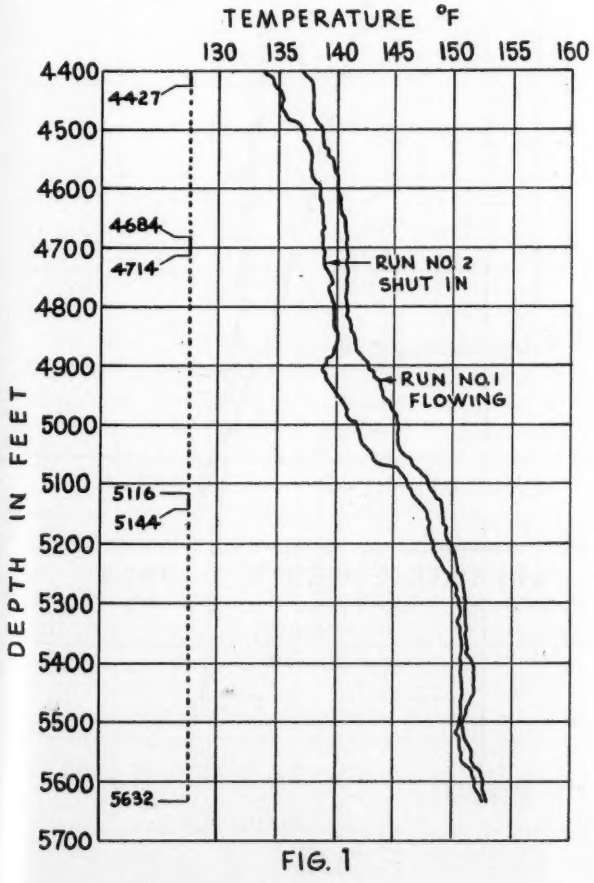


FIG. 1

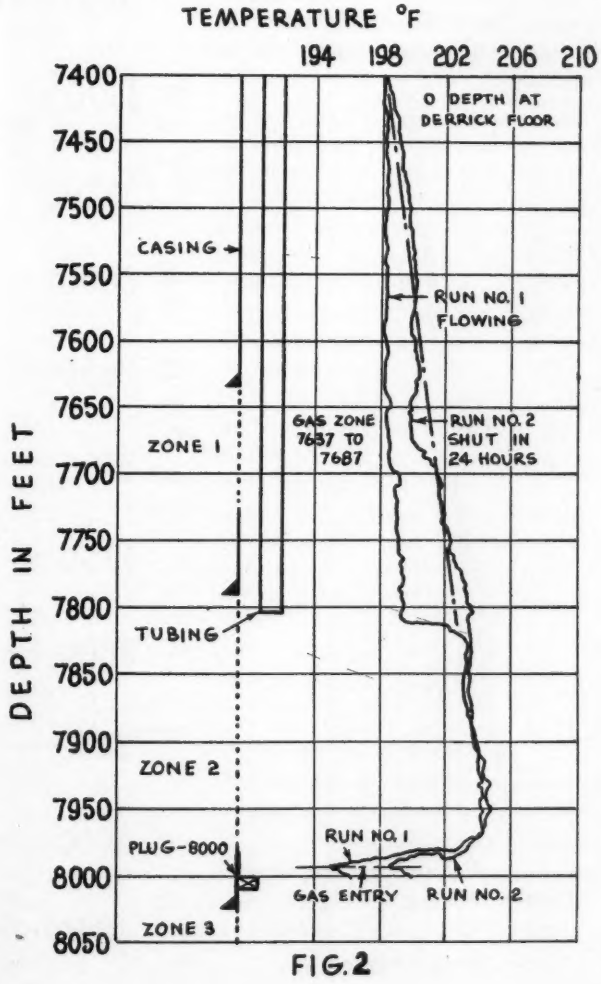


FIG. 2

Recording Thermal Instruments

A number of different temperature recording instruments have been developed for use in oil wells. In general they are of two types: those which record the temperature at successive stations, the instrument being held stationary in the well during recording, and those which produce a continuous record while the instrument is being lowered or raised at a constant controlled speed.

The type of thermometer or thermal element employed differs to a considerable extent, depending upon the method of recording and the other design features of the instrument. The principal requirements of the thermal element are that it be sensitive enough to record differential temperature of at least 0.2° F. and have a very low thermal lag. Accuracy as to actual temperature should be within 1° F. Minimum thermal lag is especially important in the continuous-recording type of instrument.

A continuous-recording thermal instrument which has been used in logging more than 150 wells in the past two years is entirely self-contained, that is, the record is made within the instrument on special high-temperature 16 mm photographic film which is later developed and projected to a greatly enlarged scale for plotting. The thermal element is a bi-metal helical coil which tends to wind or unwind as the temperature increases or decreases. This action results in the lengthening or shortening of a beam of light falling upon the film, the length of the beam indicating the temperature recorded. The thermal lag of this type of thermal element is low enough so that the instrument can be run at a speed of 2000 feet per hour.

The instrument is run on a piano wire measuring line of the sort used for running various other instruments. The timing of the instrument mechanism is synchronized with the running speed so that the record can be correctly correlated as to depth when being plotted.

Plotting of the film record is done by means of a special projection device which enlarges the images about 40 times. The film and chart paper are driven through the projector under controlled conditions so that the record taken in one minute in the well is reproduced on one inch of the chart paper. This results in a graph on a scale of 25 feet to the inch when the instrument is run in the well at a speed of 25 feet per minute.

Interpretation of Thermal Records

Records of temperature anomalies are useful to the engineer only when they are correctly interpreted. The correct interpretation produces a thermal log which can be employed as an aid in solving production prob-

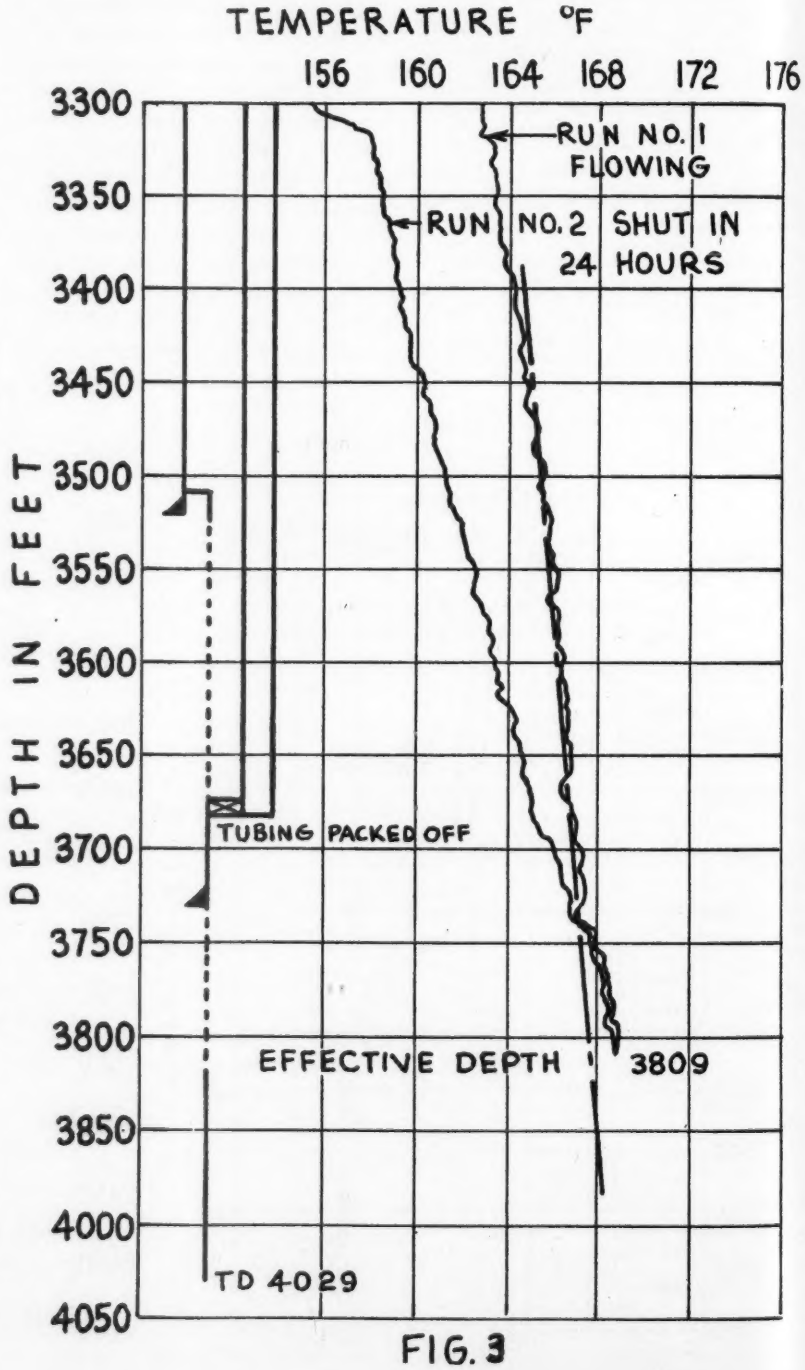


FIG. 3

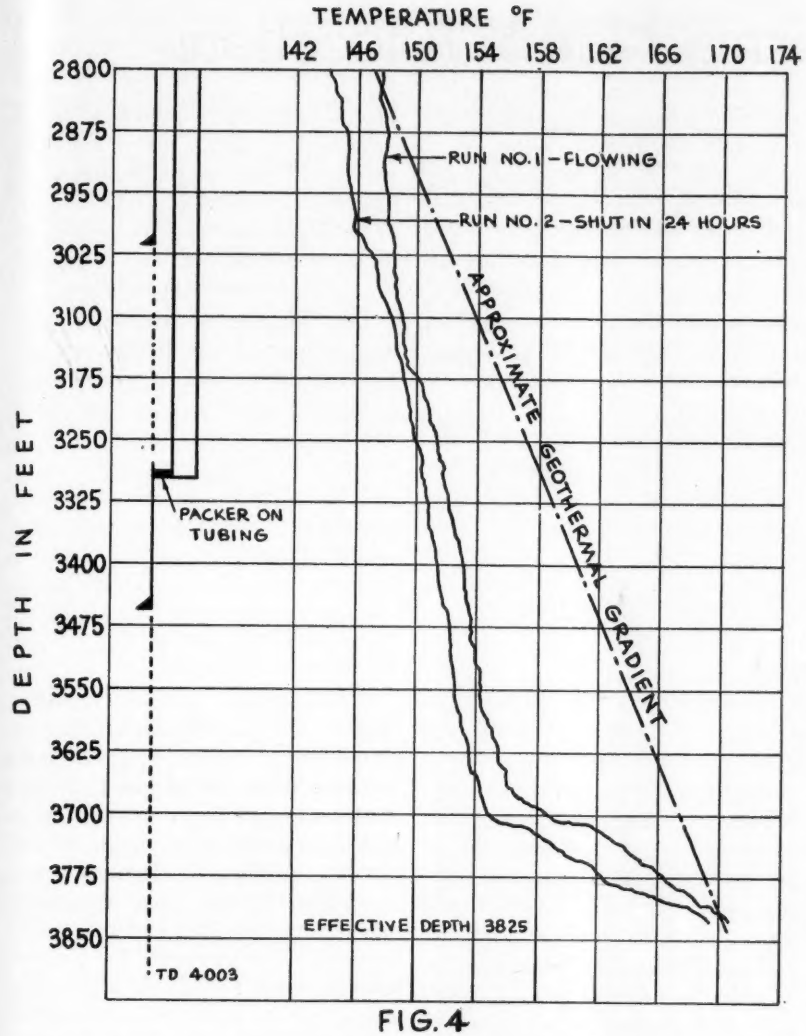


FIG. 4

lems. Several factors are of great importance and should be noted here.

Each well must be considered as an individual problem, and all other information pertaining to it should be correlated with the temperature record in making interpretations.

Well conditions under which the temperature record is taken are often as important as the accuracy of the recording instrument. Careful control of the well conditions must be exercised in order that the anomalies may be localized and developed in sufficient magnitude.

Where it is known, the normal geothermal gradient for the field can often be used as a basis for making an interpretation of the anomalies observed in the record. However, due to the variations in geothermal gradient that may occur in various parts of the structure or during the producing life of the field it may be necessary to make two traverses, one while the well is flowing and a second after the well has been shut in for a period of 24 hours. This practice has produced excellent results in locating the source of water, gas, and oil production, and in tracing the migration of fluids between zones.

Application of Thermal Logs Determining Point of Gas Entry

Figure No. 1 is a chart of two traverses made in a well to determine the point of gas entry. Run No. 1 is the flowing traverse made while the well was producing 190 barrels of oil and the gas/oil ratio was 9500 cubic feet per barrel. After the flowing traverse was made, the well was shut in for approximately 24 hours. The shut-in traverse, Run No. 2, was then made. The flowing traverse shows a definite change of gradient from 4880′ to 5070′, but from this single run it would be rather difficult to make an interpretation. Run No. 2 shows the anomaly very definitely. While the well was producing, the expanding gas coming from this area had cooled the formation. When the well was shut in there was a continuous transfer of heat from the fluid column into the formation in the area indicated by the temperature anomaly on the shut-in run. A pressure traverse made while the well was flowing indicated gradient changes that conformed to the thermal log.

The time required for a sand that has been producing free gas to become in thermal equilibrium with the adjacent formations has not been determined. Temperature anomalies have been secured opposite the area that had produced free gas in wells which had been shut in for 48 hours before making the shut-in traverse.

Pressure traverses aid in checking the interpretation of thermal logs and should be made immediately after the temperature runs. Figure 2 shows a well with three zones, with the tubing hung at the top of the second zone. A bridge plug is set in a cemented blank section between Zones 2 and 3. Zone 3 was known to have a higher pressure than Zones 1 and 2. On the flowing traverse the production was 228 barrels with a gas-oil ratio of approximately 5000 cubic feet per barrel. Run No. 1, made while the well was flowing, indicates the movement of fluid down from Zone 1 to the bottom of the tubing. The temperature anomaly at the bridge plug on both the flowing and shut-in runs is the result of gas by passing the plug from Zone 3. During the time the well was producing, the upper part of Zone 1 was cooled by the expanding gas, resulting in the temperature anomaly through this area on the shut-in run.

(To Be Continued)

Approve California March Allocations

The allocation schedules for March have been approved by the Office of Petroleum Coordinator, E. E. Pyles, Chairman of the District 5 Production Committee, has been informed by phone from Washington.

Individual well schedules are now being prepared, and are expected to be in the hands of the operators by the middle of the week.

The schedules were submitted by the District Production Committee to the Office of Petroleum Coordinator on Mar. 4. Approval by the Coordinator this early in the month marks considerable progress compared with February, when schedules were not approved until February 20, and were made effective for the remainder of the month. Total March allotment, established by the Coordinator, is 627,000 barrels per day.

A study of the heavy oil situation in California is being undertaken by the District No. 5 Office of the Petroleum Coordinator for National Defense. This study will include compilation of data as to reserves of heavy oil, possibilities of new discoveries, well-spacing required for maximum ultimate recovery, and the amount of pumping equipment necessary to equip leases for maximum output.

"The study is designed not only to determine existing conditions as to heavy oil reserves and supplies in California, but also to furnish the data necessary to formulate a policy for exceptions to Conservation Order M-68", according to Lt. Commander W. H. Osgood, director in charge of the district office. This order, issued by the War Production Board, establishes the conditions under which material can be purchased or used in oil industry operations. In general, it restricts new drilling to one well to 40 acres, and the installations of pumping equipment to one well to 10 acres. The oil industry has maintained that these general provisions do not fit California conditions, and that the restrictive effect of the order tends to cripple the local industry.

California's heavy oil supplies are of increasing importance in the conduct of the war in the Pacific, since other source of supply of fuel oil have been cut off by the Japanese.

Reduction of crude oil production in District Three by 204,100 barrels daily under previously recommended rates was called for by Petroleum Coordinator Harold L. Ickes in telegrams to the regulatory bodies of the five Southwestern States, last week.

The telegrams mentioned the interference with tanker transportation from Gulf Coast ports to the Atlantic Seaboard, and added:

"Situation shows no prospect of immediate improvement so in order to balance crude oil production with available transportation facilities and to avoid filling crude and products storage to distress levels, it is advisable to reduce the March crude oil production of District Three by 204,100 barrels daily below production rates previously recommended to supply unobstructed demand.

"This necessary reduction in crude oil output should apply to fields other than those from which entire present production is required for aviation gasoline, toluene, butadiene and aviation lubricants.

"Revised daily rates of production recommended for District Three States for March are: Arkansas 71,500, Louisiana 314,700, Mississippi 53,100, New Mexico 100,200 and Texas, 1,338,600. The production of each State should be adjusted to the revised recommended rates as soon as possible to avoid further serious dislocations."

The oil industry was charged last week by the Office of the Petroleum Coordinator with the task of immediately arranging for the distribution of available petroleum products in a manner best calculated to overcome supply difficulties in all parts of the Nation.

Deputy Coordinator Ralph K. Davies called for comprehensive industry-wide action to accomplish this result in a formal amendment to Coordinator's Recommendation No. 33, addressed to the various district industry committees "and to all persons in the petroleum industry."

The amendment authorizes the appointment of special industry subcommittees in each of the five coordinating districts, or of joint subcommittees representing two or more districts, and empowers them:

1. To obtain, analyze and keep current all information regarding available supplies and the demand for petroleum and petroleum products, and with respect to transportation facilities serving the particular district or districts.

2. To prepare plans for submission to the chief counsel, Office of Petroleum Coordinator, which may (a) determine the amounts of petroleum and products and the transportation facilities available to the district involved to meet military war industry and essential civilian needs in that district and other areas; and (b) provide for the exchange, loan, sale, lease or pooling of petroleum and products and of production, transportation, refining and storage facilities to whatever extent necessary to supply the required amounts of oil.

3. To carry into effect any approved plan, subject to the direction of the Coordinator or the Deputy Coordinator.

4. In cases of an emergency character which may arise pending the approval of appropriate plans, and subject to the direction of the appropriate functional director of the Office of the Petroleum Coordinator in the district involved, to coordinate and arrange for the sale, exchange or loan of petroleum and products among the various operators.

Recommendation No. 33 originally provided only for the appointment of a special subcommittee on

supplies and distribution in District One (East Coast).

As amended, it permits the setting up of additional committees—in any district—whenever the General Industry Committee for that district finds the existence of a problem of petroleum supply or distribution which affects two or more divisions of the industry and therefore does not come entirely within the jurisdiction of one of the already established district functional committees.

Mr. Davies emphasized that although the scope of Recommendation No. 33 had been broadened to permit industry action according to its terms in all coordinating districts, this was not to be interpreted as a request to the District Five Marketing Committee to discontinue or abandon procedure already adopted by it under Recommendation No. 29.

On the contrary, he said, action initiated by the District Five committee under Recommendation No. 29—which authorizes measures similar to those permitted by No. 33—should be pressed forward aggressively in a continuation of the effort to alleviate supply difficulties in Pacific Coast areas.

E. T. Howes Joins Magnetest Corp.

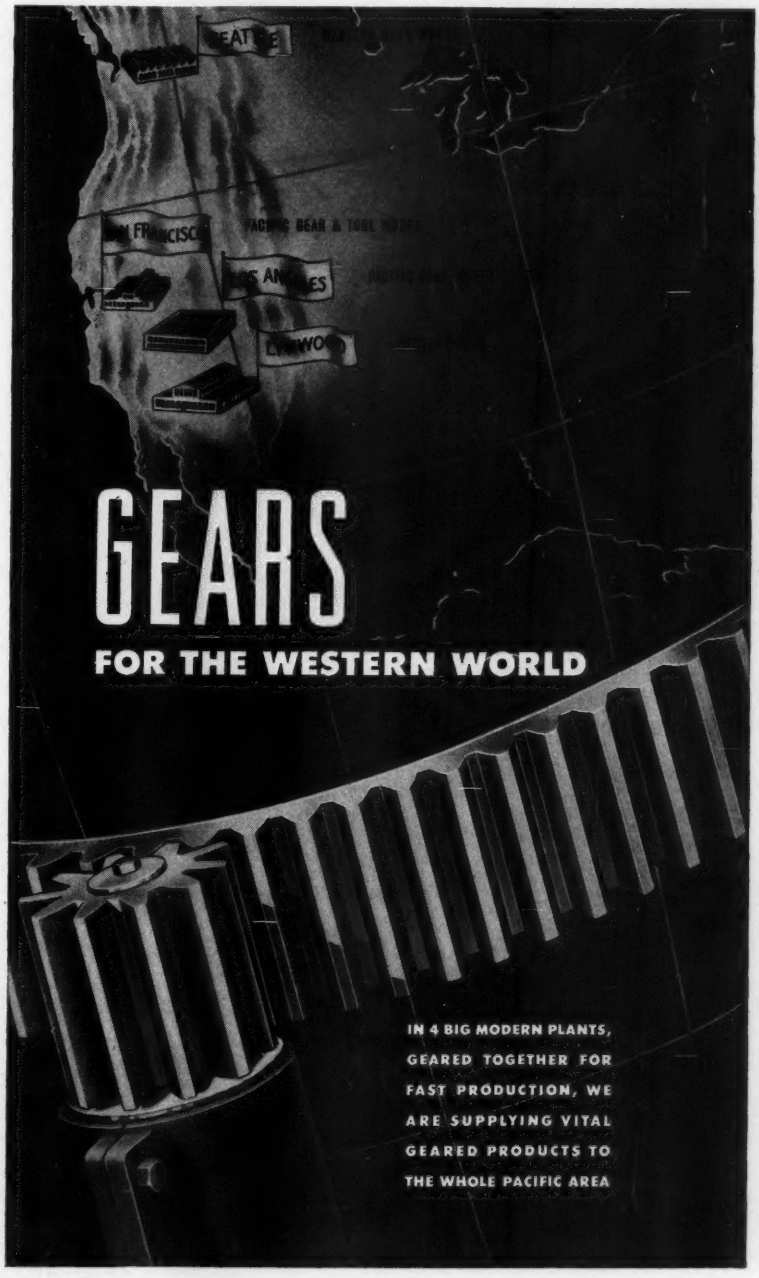
Edgar T. (Ted) Howes, formerly with Schlumberger Corp., became associated with Magnetest Corp., Feb. 16, 1942 as chief engineer. Mr. Howes, a native of California, was graduated from U. S. C. with a degree of B. S. in Electrical Engineering in 1924. For ten years he was in the general contracting business as a partner in the firm of Reeves and Howes. Following this he was employed by International Geophysics Co. in research and development work. For the past five years he was employed as an engineer by Schlumberger Well Surveying Corp., holding at the time of his resignation from Schlumberger the position as manager of the Long Beach District.

Mr. Howes has been a member of the Institute of Radio Engineers for 20 years and has held an amateur radio operator's license for the same period.

Emmett M. Irwin resigned from Magnetest Corp. and has opened a consulting office at 412 Petroleum Building, 714 W. Olympic Blvd., Los Angeles, Calif. He is representing Waugh Laboratories of New York City locally.

Treasury Proposes Cut in Depletion Allowance

Secretary Morgenthau, in presenting his proposed tax schedule for 1942, advocated that percentage depletion allowances for oil and gas be either reduced or eliminated, and estimated that this move would raise $80,000,000 this year. The tax was explained to mean the discontinuance of the percentage depletion allowed natural resource industries and permit depletion only on a cost basis. However, as a concession for going properties, it is suggested that for oil and gas properties which became productive prior to January 1, 1942, percentage depletion should be permitted at a rate of 15 per cent of gross income from the property in the case of companies who elect to charge intangible drilling and development costs to capital in the prior taxable year. Those who elect to charge such costs to expense in prior years would be limited to a percentage depletion allowance of 5 per cent. As an inducement to new discoveries, it is proposed that a taxpayer who in the future discovers a new pool would obtain percentage depletion with respect to all production from his entire acreage within such pool at the rate determined upon, but not to exceed 27½ per cent. Each new zone or horizon would be considered a new pool for this purpose. Such allowance of percentage depletion would be limited to those taxpayers who contributed substantially toward the cost of the exploration well.


GEARS
FOR THE WESTERN WORLD
IN 4 BIG MODERN PLANTS, GEARED TOGETHER FOR FAST PRODUCTION, WE ARE SUPPLYING VITAL GEARED PRODUCTS TO THE WHOLE PACIFIC AREA

THIS LAUGH OFF!!

A laudable example of taciturnity was Grandpappy Ables, hillbilly, who had wandered into the woods and failed to return for supper. One of the young Ables was sent to look for grandpappy, and soon discovered the oldster standing in some bushes.

"Getting dark, Grandpap," the youngster ventured.

"Yep."

"Suppertime, Grandpap."

"Yep."

"Wal, airn't you coming home?"

"Nope."

"Why airn't ye?"

"Standin' in a b'ar trap."

Drunk (to splendidly uniformed bystander): "Shay, call me a cab, will yuh?"

Splendidly Uniformed Bystander: "My good man, I am not a doorman, I am a naval officer."

Drunk: "Awright, then, call me a boat. I gotta get home."

Doe: "Gee, but I'm homesick tonight."

Poe: "Say, I thought this was your home."

Doe: "It is, but I'm sick of it."

Nurse (in insane asylum): "There is a man outside who wants to know if we have lost any inmates."

Doctor: "Why?"

Nurse: "He says someone has run off with his wife."

Adam and Eve in the garden had had a pretty hard day naming the animals.

"Well, Eve," says Adam, "let's call this one a hippopotamus."

"But, darling, why call it a hippopotamus?"

"Well, heck, it looks like a hippopotamus, don't it?"

She: "When we get married I'm going to cook, sew, darn your socks and lay out your pipe and slippers. What more can any man ask than that?"

He: "Nothing, unless he is evil-minded."

Executive Officer: "Admiral, the ship's leaking."

Admiral: "Whose fault is it?"

Executive Officer: "It's the carpenter's fault."

Admiral: "Rub his nose in it."

"Your husband looks like a smart man. I suppose he knows everything."

"Don't fool yourself. He doesn't even suspect anything."

"What's a skeleton?"

"It's a person with all the people scraped off."

North: I bid one Heart.
East: I bid a Spade.
South: Two Hearts.
West: Bye.
N.: Three Hearts.
E.: Three Spades.
S.: Four Hearts.
W.: Bye.
N.: Five Hearts.
E.: Five Spades.
S.: Six Hearts.
W.: Bye.
N.: Seven Hearts.
E.: Seven Spades.
S.: Double.
W.: Bye.
N.: Bye.
E.: Redouble.
S.: Okay, West, you're dummy. Lay down your cards.
W.: Heck, it must be a misdeal. I haven't got any cards.

Mrs. Brown took Mr. Brown to a style show. A particularly attractive frock on a pretty blonde model appealed to her.

"That would look very nice at our party Saturday," she said, in her best "buy me that" mood.

"It sure would," said Mr. Brown, "let's invite her."

Names used on this page are entirely fictitious, and any resemblance to persons either living or dead is purely coincidental.

WARTIME PROGRAM

Rental Service

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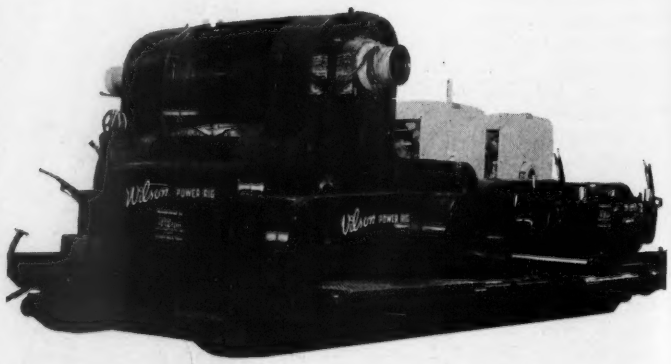

Nomads 3rd Inaugural Ball

The Third Annual Inaugural Ball of the Los Angeles Chapter of Nomads was held at the Pacific Coast Club, Long Beach, Cal., Feb. 20. Dinner was at eight and dancing started at nine. Preceding the dinner, members entertained their guests with cocktails in the lounge adjacent to the dining room. Music for dancing was furnished by Byron Wolffe's orchestra.

The ball was in honor of the incoming and outgoing officers and national regents. The incoming officers are W. F. Bettis, president; E. M. Rees, vice-president; R. J. Eiche, secretary; E. R. Smith, treasurer; R. E. Smith, sergeant at arms; J. C. Ballagh, assistant secretary; D. B. Waite, assistant treasurer; and T. C. Murphy, assistant sergeant at arms. The outgoing officers were E. B. Fowks, president; W. F. Bettis, vice-president; E. M. Rees, secretary-treasurer; R. J. Eiche, sergeant at arms; E. R. Smith, assistant secretary-treasurer; and Roy Hitchcock, assistant sergeant at arms. T. Sutter remains as one of the national regents and E. B. Fowks becomes the second national regent.

Over two hundred people were in attendance and among the guests from countries outside the United States were John Domercq of California Standard Arabian Oil Co., who has until recently been stationed in Arabia; William Thornberry of Ecuador Oil Fields, Ltd., who is on a visit from Ecuador; A. F. Driskill of Iraq Petroleum Co., who is waiting for world conditions to permit his return to Iraq; Jack Devine, also of the Iraq Petroleum from Iraq; Bill Foran, who was formerly stationed in Iraq for the Iraq Petroleum; Fred Vandenburg of the Colombian Petroleum Co., who is on a visit from Colombia; and G. C. Higgins, with the B.P.M., who is waiting to return to duty either in the Near East or East Indies when conditions permit. Claude Banta and Al Farrow were guests from the Houston Chapter of Nomads.

"Bill" Champion Is New Arrival

Mr. and Mrs. Frank Champion announce the birth at Los Angeles, Calif., on February 18, 1942, of William Lamb Champion.

New officers of the Los Angeles Chapter of Nomads at the Third Annual Inaugural Ball. Left to right: Seated, Roland E. Smith, sergeant at arms; W. F. Bettis, president; E. M. Rees, vice-president; Elmer L. Smith, treasurer. Standing, J. C. Ballagh, assistant secretary; E. B. Fowks, national regent, and D. B. Waite, assistant treasurer.

Field Development

Los Angeles Basin

Castaic Wildcat Looks Interesting

One of the most interesting wildcat wells in the southern district is Mangold & Morse Oil Co.'s McDermott No. 1 in sec. 26,5n-17w at Castaic. When last reported at 3520 ft., the project was drilling in a hard conglomerate believed to be the Del Montian lying immediately above the Miocene shales and sands in which production is sought. The present stratum is the second conglomerate encountered and, in the opinion of some geologists, may be a duplication of beds due to faulting. Oil and gas has consistently shown on the ditch since entering the conglomerate and two attempts were made to get a formation test of the interval 2980-3350 ft. Both failed for lack of a proper shoulder on which to set the packer.

Lytle to Drill Turnbull Wildcat

Looking for something new in the Turnbull Canyon area, Robert S. Lytle, operator for the Doheny interests, has spotted a new wildcat on fee property of the old Central Oil Co. in the center of the southeast quarter of sec. 15,2s-11w. This location is on the south slope of the Puente Hills and is across the canyon to the west of Turnbull Canyon Road. A test of the Miocene to at least 5000 ft. is contemplated.

Lack of fluid seems to be the main trouble with Axis Petroleum Co.'s Tandberg No. 1 on the north side of the hills. In testing the interval 3330-3440 ft., the well flowed a few short heads of oil and mud.

Axis' Rowland Ranch No. 1, located in sec. 21,2s-10w, two miles southeast of Continental Oil Co.'s good wells, is drilling below 1400 ft.

Willis Completes Newhall Wildcat

Flowing at the initial rate of 200 bbls. a day, C. G. Willis & Associates brought in Ferguson No. 1 southeast of the Newhall-Potrero field as the first discovery in the Newhall area for the year. Located in sec. 36,4n-17w about 7000 ft. from the nearest producer, the Willis project topped the First Zone at 6700 ft., only slightly lower than Barnsdall Oil Co.'s Rancho San Francisco No. 14. The new well drilled to 7519 ft. topping the Third Zone, main Newhall-Potrero horizon, at 7220 ft. The lower measures were wet, however, and the hole was plugged and tested by stages back to 7020 ft. A perforated liner was landed on the plug and the 7 in. casing which earlier had been cemented at 6857 ft., was gun perforated 6700-6730 ft. and 6770-6835 ft. Tubing was run with a packer at 6660 ft. and the well completed flowing clean 34 gravity oil by heads through a bean which

LOS ANGELES BASIN WILDCATS

Area	Well	No.	Section	Depth	Status
Castaic	Mangold & Morse Oil Co., McDermott	1	26, 5-17	3454	Drilling
	Young, Roy, W., Inc., Walker	1	11, 4-16	8166	Drilling
Newhall	Airline Oil Co., Perkins	1	11, 3-16	2360	Drilling
	Willis & Assoc., Ferguson	1	36, 4-17	7519	Testing
Palmdale	Wesco Const. Co., Well	1	20, 5-9	2908	Re-rigging
Palos Verdes	Surety Holding Co.	1	22, 5-14	1480	Idle
Puente Hills	Axis Pet. Co., Tandberg	1	13, 2-11	4189	Testing
	Axis Pet. Co., Rowland	1	21, 2-10	1387	Drilling
	Lytle, Robt. S., Opr., Central	1	15, 2-11		Grading
Rio Hondo	Potrero Oil Co., Well	1	32, 1-11	5370	Fishing
San Fernando	Fernando Oils, Ltd., Chatsworth	1	18, 2-16		Rig
	Shell Oil Co., Mission	2–1	25, 3-16	6235	Drilling
	Tide Water Assoc., Mission	1	26, 3-16	9291	Testing
	Tide Water Assoc., Sesnon	1	28, 3-16	5295	Drilling
Whittier-La Habra	Los Nietos Valley Oil Co., Woodard	1	29, 2-11	50	Idle
	Orange County				
Anaheim	The Texas Co., Spencer	1	1, 4-11	9660	Testing
Bolsa Chica	La Bolsa Ro. Synd., Crane	1	22, 5-11	6956	Testing
Costa Mesa	Thompson, Milton N., Banning	1	9, 6-10	5649	Fishing D.P.
Cypress	Midfield Pet. Co., Cypress	1	16, 4-11		Location
Kraemer	Atlas Oil Co., Kraemer	1	36, 3-9	2675	Idle
	South Basin Oil Co., Well	103	24, 3-9		Foundation

was varied from 24/64 in. to 32/64 in.

Aside from the Willis group, chief beneficiary from the discovery appears to be Barnsdall Oil Co. which holds adjoining leases. Already Barnsdall Oil Co. has spudded its No. 31 southeast of No. 14 as the first step in proving the possible connection between the two productive areas. It is expected that the completion of Ferguson No. 1 will provide a strong stimulus for wildcatting and tentative plans are being drawn to resume work on Aztec Oil Co.'s Sanborn No. 1 and Newhall-Potrero Oil Co.'s Ferguson No. 1.

Union Completing East Coyote Well

Union Oil Co. is preparing to complete Hole No. 23 in the deep sand at the west end of the East Coyote field after setting 7 in. casing at 6471 ft. The well was drilled to 7194 ft. and plugged to 7010 ft. when bottom sands looked questionable on the electric log. Eliminating a string of casing, Union cemented the 7 in. casing through perforations at 3766 ft. above the upper oil sands.

Buena Park Wildcat Flows 85 Bbls. a Day

To discover the first new Orange county field since Huntington Beach was brought in 22 years ago, The Texas Co. completed Spencer No. 1 at Buena Park flowing 85 bbls. of 21.2 gravity clean oil. The significance of the well is far greater than the production rate would at first indicate as it virtually proves the theory that oil not only can be but has been trapped in sands rising toward the east side of the Los Angeles Basin where the sands are overlapped by impervious shales. At its present rate, Spencer No. 1 can hardly be considered a commercial proposition because of the depth of the producing interval, 8900 to 8932 ft., but the knowledge gained from its drilling is potentially worth many millions of dollars.

The sand from which production is obtained is roughly comparable to the Bell Zone of Santa Fe Springs and was not present in No. A-13-1 which The Texas Co. drilled three years ago a mile and a half to the southeast. This is taken to indicate a pinching out of the sand somewhere between the two wells. The problem now is to locate the next test in a higher position without going beyond the point of the pinching out. Present indications are that the company will chose a site roughly half a mile due east of Spencer No. 1 where it is hoped that the sand will be encountered sufficiently high to afford prolific production of higher gravity oil.

Geologically, Spencer No. 1 was interesting in that it tested and found wet sands at 8700 ft. which appear equivalent to the Foix Zone or top oil sands of Santa Fe Springs. These in a higher structural location

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may also be found productive. Bottom of the hole at 9660 ft. is in formation similar to the Sespe of Ventura county.

Possibly in conjunction with other operators, The Texas Co. tentatively plans to drill another wildcat in the La Mirada area west of the West Coyote field.

New Field Looms Near Aliso Canyon

Indicating good possibilities for a new discovery a mile east of the Aliso Canyon field, Tide Water Associated Oil Co. is testing Mission No. 1 in sec. 26,3n-16w. · Drilled to 9291 ft., the well encountered formations similar to the deep zone in the nearby field and set casing at 8988 ft. after which the hole was cleaned out and a formation test run. Fearing possible heavy gas pressure, the weighted drilling mud was left in the hole which limited recovery to a quantity of heavy gas-cut mud. At last reports, tubing was being run in the belief that a more adequate test with less danger of a blow-out can be made by swabbing the well. If Mission No. 1 is successful it will remain to be demonstrated whether the new area is an extension of the Porter No. 12 Zone or is a separate accumulation. If the former proves to be the case, the field will ultimately be a large one as the westerly outpost, Porter No. 26, is nearly two miles to the west.

At present the deep zone is produced by only two wells, Porter No. 12 and Porter No. 26 both of which are capable of flowing large quantities of gas and light oil condensate.

In sec. 25,3n-16w a mile east of Tide Water's Mission No. 1, Shell Oil Co., Inc. is drilling Mission No. 2-1 near the 6250 ft. level. This well is said to be seeking a separate accumulation.

Immediately north of the discovery well in Aliso Canyon, Universal Consolidated Oil Co. is deepening Ward No. 1 at 8650 ft. in shale streaked with gray sand. Although not far distant from Porter No. 12, the deep horizon has not proved productive at this location.

Continental Plans Castaic Wildcat

Taking over a block of leases from Ohio Oil Co., Continental Oil Co. is reported to be planning to drill a wildcat well on Ramona Anticline in the northwest quarter of sec. 14,4n-18w. The well site will be in Nuevo Canyon approximately three miles west of the nearest production at Del Valle.

La Bolsa Well Tests Ashton

La Bolsa Rancho Oil Syndicate's Crane No. 1, located in the southwest corner of sec. 22,5s-11w a mile north of the west end of the Huntington Beach field, was last reported as attempting to make a formation test of a sandy horizon believed to be the Lower Ashton zone. Bottom was at 6956 ft.

W. Gulf Drills Two In Oak Canyon Field

Western Gulf Oil Co. has two strings of tools working in the Oak Canyon field at present. The company's easterly outpost, L. W. Gilmour-U. S. No. 1 is approaching a critical depth of 6550 ft. while Lechler No. 3 is directionally redrilling at 5600 ft.

Derrick Erected For Kraemer Test

Intending to spud as soon as possible, South Basin Oil Co. has the derrick erected for its new exploratory well, No. 103, on Kraemer property east of Richfield and north of Kraemer One field. The drilling contract has been let to Dunlap & Graham of Long Beach.

Geology of the play was worked out by Chester Gardner who for many years has specialized in the easterly portion of the Los Angeles Basin. Mr. Gardner was perhaps the first man to recommend the drilling of the Buena Park-Anaheim area, having reported favorably on it some years ago.

Seaboard Plans Reservoir Test

Seaboard Oil Co. has applied to the Los Angeles City Planning Commission for rezoning to permit drilling a wildcat well near the San Fernando Reservoir. Action by the commission is expected in the next few weeks.

Potrero Resumes At Rio Hondo

Potrero Oil Co. has resumed fishing operations in its Newman No. 1 in the Rio Hondo area north of the east end of the Montebello field. Drill pipe, twisted off on bottom at 5370 ft. two months ago, has been recovered to 3750 ft.

Study Allocations For Excess Cut Wells

An investigation of the problem of allocation of oil to wells which also produce excessive amounts of water will be requested of the various field committee chairmen by the Allocation Subcommittee of the Conservation Committe of California Oil Producers. In addition, the Allocation Committee chairman, H. C. Pyle, will request the Production Committee for District No. 5 to consider the problem, at its next meeting.

This action, taken by the allocation committee following a meeting with several affected operators Mar. 5, was decided upon as the most effective approach to the problem when discussion brought out that there appeared to be no general rule or formula that offered a solution.

A letter to field committee chairmen will ask that their study of the problem be directed toward discovery of a solution.

BUY DEFENSE BONDS

San Joaquin Valley

Bristol Oil Starts South Dome Wildcat

Bristol Oil Corp. is rigging up to drill Hellman No. 1 as a relatively shallow test of sec. 2,25-19. Located just inside Kern County limits, the well is situated on Kettleman South Dome and near the company's Smith No. 1 which obtained limited production from the 1700 ft. level.

Shell Grades For Belridge Outpost

Shell Oil Co., Inc., is grading sites for Williams No. 45-6 near the center of sec. 6,28-20, a little more than five miles west of North Belridge production. The well continues a long term company belief in the area since it has previously drilled two wells in the immediate vicinity. First was Voight No. 3-1, in section 5 a little more than three quarters of a mile to the east, which unsuccessfully bottomed at 4854 ft. in 1936. Two years later the company drilled Voight No. 1-1 in sec. 32,27-20, a little more than a mile and a half northeast of here, to a total depth of 4100 ft. Other substantial operators have previously prospected the areas lying west of the Belridge fields on widely spaced locations to depths near 6000 ft.

Richfield Deep In Northern Wildcat

Most northerly of all Fresno County activity is Richfield Oil Corp.'s Ponte No. 1 in sec. 30,13-17, midway between Fresno and Mendota. Last reported spot coring at 6924 ft. the well was known to be deep in the geologic section since the Cretaceous was found at 4770 ft. and the Eocene at 4617 ft. Only encouragement thus far known was meager showings in the Temblor near 3500 ft.

So. Helm Area Results Poor

General Petroleum Corp.'s Esperoad No. 75-33 in sec. 33,16-17, southerly extension try in the newly discovered Helm area of Fresno county, has been consistently disappointing on a series of formation trials uphole from Eocene bottom at 8266 ft. An open hole test at bottom recovered only muddy salt water and was considered inconclusive so 358 ft. of blank 7 in. casing was cemented on bottom and gun perforated for further unsuccessful trials. Last tested interval, 8040-8055 ft., recovered muddy salt water and a trace of oil and a light steady gas blow. At last report operators were gun perforating from 8080 to 8095 ft. for a try of sands in the Kreyenhagen or transitional zone between the Miocene and Eocene ages.

Amerada Petroleum Corp., discoverer of the field, completed and shut in its second well, Weyant No. 5-27 in sec. 27,16-17. Drilled to bar-

SAN JOAQUIN VALLEY WILDCATS

Area	Well	No.	Section	Depth	Status
	Fresno County				
Guijarral Hills	Lytle, Robt. S., Opr., Well	68-28F	28, 20-16	6771	Drilling
Helm	Amerada Pet. Co., Clover	75–28	28, 16-17	3138	Drilling
	General Pet. Corp., Esperoad	75–33	33, 16-17	8266	Testing
Jacalitos Hills	Wilshire Annex Oil Co.	45–26E	26, 21-15	3867	Completed
	Wilshire Annex Oil Co.	8–23E	23, 21-15	3050	Drilling
Kerman	Richfield Oil Corp., Ponte	1	30, 13-17	6924	Drilling
Raisin City	Seaboard-T.W.A.-Union	86–13	13, 15-17		Foundation
	Shell Oil Co., Inc., Prop., Inc.	37–18	18, 15-18	4485	Drilling
	Shell Oil Co., Inc., S.A. & F.L.	22–19	19, 15-18		Location
Riverdale	Amerada Pet. Corp.. Jensen	54–26	26, 17-19	7612	Completing
	Amerada Pet. Corp., Lawton	58–26	26, 17-19		Foundation
	Amerada Pet. Corp.. Leal	34–26	26, 17-19	2742	Drilling
	General Pet. Corp., Comm. 8	45–21	21, 17-19	1598	Drilling
	Kern County				
Belridge	Shell Oil Co., Inc., Williams	45–6	6, 28-20		Grade
Buttonwillow	The Texas Co., Root	9–C	9, 29-24		Rigging up
	The Texas Co., KCL	24–C	24, 29-24	3534	Drilling
Devils Den	Continental Oil Co., Mabury	1	25, 26-18	1972	Laying lines
Dyer Creek	Dyer Creek Oil Co., Church	1	2, 26-27	302	Drilling
	Shell Oil Co., Smith Cairns	3	11, 26-27	2332	Bailing
Edison	Getty, J. Paul, Mattson	1	6, 30-29		Location
Grapevine	Richfield Oil Corp., KCL	3	36, 11-20	1572	Drilling
Kern River	Seaboard Oil Corp., Fuhrman	1	28, 28-28		Rigging up
Kettleman–So.	Bristol Oil Corp., Hellman	1	2, 25-19		Rigging up
Midway	Western Minerals Co., U.S.A.	37–25	25, 11-23		Rigging up
Mt. Poso	Alpha Oil Co., C. V. Elliott	1A	1, 27-28	1050	Drilling
	Signal Pet. Co., Loudon	1	32, 26-28	1858	Abandoning
	Signal Oil & Gas Co., Signal-Bishop	2	22, 27-28		Location
	Signal Oil & Gas Co., Glide	23–1	22, 27-28		Location
	Union Oil Co., Glide	1–7	7, 27-28	70	Drilling
Paloma	General Pet. Corp., Gallagher	61–33	33, 31-26	1814	Idle
	Ohio Oil Co., KCL A-10	41–4	4, 32-26	10211	Drilling
	Western Gulf Oil Co., L.A.A.C.	36–1	6, 32-27		Foundation
	Western Gulf Oil Co., Symons	12–7	7, 32-27	11811	Testing
Richgrove	Bolling, R. S., Quinn	3	15, 25-27	2926	Idle
	Shell Oil Co., Curry	1	20, 25-26	6125	Drilling
	Wilshire Annex Oil Co., Amalg.	1	17, 25-28	1152	Drilling
Shafter	Continental Oil Co., Neuman	1	36, 27-24	10822	Drilling
	General Pet. Corp., S.P.	51–15	15, 28-24	14252	Testing
Shale Hills	Tideland Oil Co., Grant Est.	1	4, 27-18	4015	Drilling
Union Avenue	Hancock Oil Co., Roberts	4	6, 30-28	5377	Cleaning out
	Kings County				
Dudley Ridge	Dudley Ridge O. C. Ltd., D.R.	3–16	3, 23-19	1627	Flowed gas
Pyramid Hills	Pacific O. & G. Dev. Corp., West Slope	2	20, 24-18		Location
	Tulare County				
Pixley	Continental Oil Co., Pixley Comm.	1	9, 23-25	4793	Drilling
Terra Bella	Stout, Geo. W., Stout	2	11, 23-27	745	Idle
Trico	Trico Oil & Gas Co., Lee	1	17, 24-23		Rig
Tulare	Richfield O. Corp., Tulare Comm.	1-1	33, 19-24		Location

ren Cretaceous at 8500 ft. the well was plugged and finished in Eocene sands from 8100 to 8110 ft. for 254 bbls. of clean 31 gravity oil through a 15/64 in. bean. The small orifice allowed a 144,000 cu. ft. gas flow.

Amerada has moved one section to the west and is drilling Clover No. 75-28 at 3138 ft. near the east quarter corner of sec. 28,16-17.

Formation Withheld On Guijarral Hills Well

No accurate information has been forthcoming on the joint test which Robert S. Lytle, Operator is drilling in the Guijarral Hills area of Fresno county. Known as No. 68-28F the wildcat is a venture sponsored by Lytle, Seaboard Oil Corp. and Honolulu Oil Corp., and was last reported at 6771 ft. after marking the McLure Shale at 5715 ft.

Located southeast of the Coalinga Eocene Pool on a trend toward the Kettleman North Dome in sec. 28, 20-16, the well is the first development in the area since the Eocene possibilities of the area were demonstrated by production in each field.

Possible productive zones in the area are varied since the Avenal sandstone of the Eocene is proved in each adjacent field and in Kettleman the Temblor and Vedder sections of the Miocene also are productive. Failing to find saturation, the project may yet seek production in the Cretaceous, still the white hope of Valley wildcats although to date such results have been generally disappointing.

Wilshire Oil Starts New Jacalitos Well

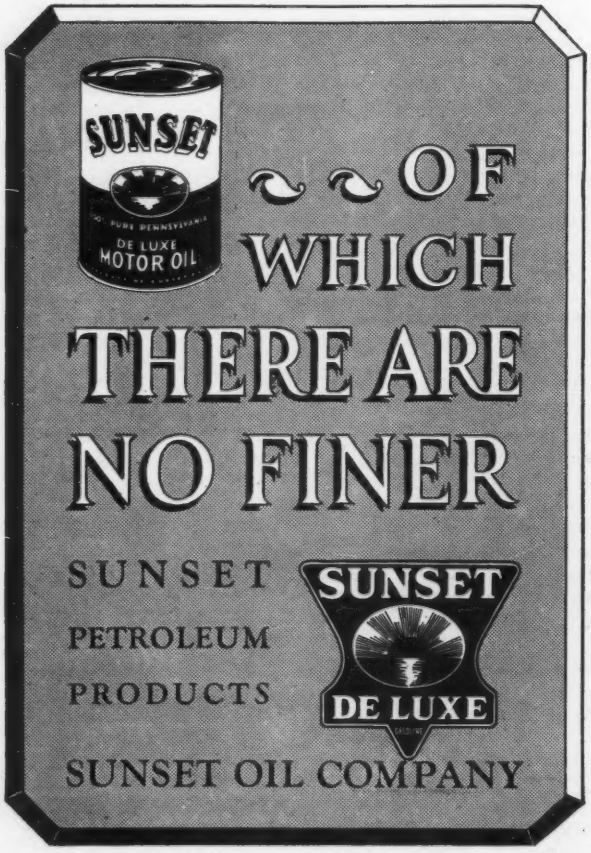
Wilshire Annex Oil Co. has moved slightly northwest in its development program of the newly discovered Jacalitos Hills field and is currently drilling No. 8-23 E in the southwest corner of sec. 23,21-15. Last reported drilling at 3050 ft., the well is being put down under contract by Rocky Mountain Drilling Co.

Wilshire's third and latest completion in its new field was No. 45-26E near the center of sec. 26, 21-15. Bottomed at 3867 ft. the well was finished flowing 180 bbls. of clean 40 gravity oil through a 14/64 in. bean.

Three Drilling In New Riverdale Field

Three projects are currently active in the Riverdale field discovered by Amerada Petroleum Corp. in December, 1941. Located near the southerly Fresno county line between the towns of Hanford and Helm, the field was established when Lawton No. 45-26, an 8311 ft. wildcat, was completed flowing 558 bbls. of clean 34 gravity oil and 1,375,000 cu. ft. of gas from a 20 ft. interval above 6685 ft.

The company's second well, Jensen No. 54-26 northeast of the Lawton project in sec. 26,17-19, bottomed in shale at 7612 ft., cemented 7 in. casing at 6775 ft. and cemented blank 5 in. liner at 6890 ft. for per-



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foration trials of the sands. A prior formation test from 6775 to 6915 ft. resulted in a 15,000,000 cu. ft. gas blow and the recovery of some 37 plus gravity oil.

Amerada also is drilling Leal No. 34-26 at 2742 ft. in the discovery section and has poured foundation for Lawton No. 58-26 on an adjacent site.

Seeking to extend production northwesterly toward the nearby and also newly discovered Helm field, General Petroleum Corp. spudded Community Eight No. 45-21 near the center of sec. 21,17-19 and was last reported at 1600 ft.

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Morton Recompletes Then Fire Wrecks Rig

Harold C. Morton's Core Hole No. 1 in the Devil's Den-Blackwell's Corner area was razed by fire after recompleting for 55 bbls. of clean 13 gravity oil. Located in the center of the southwest quarter of sec. 30, 26-19 the well was drilled in 1941 to Eocene at 2208 ft., plugged to 1000 ft. and finished in what is believed to be Vaqueros sands for 50 bbls. diminishing to 10 bbls. in thirty days. Resuming operations late in February the old liner was pulled and the well cleaned out to 996 ft. where new liner containing 152 ft. of perforations was landed. Recompleted on the pump the well was making 55 bbls. of good heavy oil when the blaze occurred. The well will be re-tested as soon as cleaning up and re-rigging operations are complete.

In the northeast quarter of the adjoining sec. 25,26-18, Continental Oil Co.'s Mabury No. 1 is believed to have cored the Morton Zone in the interval 823 to 906 ft. with the top of the Kreyenhagen found at approximately 940 ft. The project was last reported in shale and gray sand at 1972 ft.

Texaco Continues Bowerbank Work

The Texas Co. is working on two additional projects in its newly discovered Bowerbank Gas field in the Central San Joaquin Valley. First to get under way was KCL No. 24-C, last reported drilling at 3534 ft. in sec. 24,29-24 while the second, Root No. 9-C, is rigging up in sec. 9,29-24.

Getty to Drill 2nd Edison Well

Provided with adequate acreage to conform to the space regulations of M-68, J. Paul Getty is preparing to drill Mattson No. 1 in the southeast quarter of sec. 6,30-28 due west

in other words

by JOHN CLINTON

There, next door, in the early morning sunlight stood my neighbor's beautiful wife, gazing wistfully at her gallant but slightly battered little Ford. I dropped the rake and lightly vaulted the fence – and fell flat on my face!

* * *

"What," I asked, brushing the twigs off, "is the matter with the car?" "Well, nothing's *really* wrong, I guess," she replied, "but it squeaks like a mouse and rides like a carpet sweeper — and I wonder if it'll last until we can have new autes, again."

* * *

"Come sit here on the running board beside me," I said, "and I'll tell you how you can make your car last not only for the duration, but keep it right in the pink of condition." "My," she said, "you're wonderful!"

* * *

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* * *

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of his recent discovery well Portals Corp. No. 1 in section 5.

The Portals well was finished in December, 1941, flowing 175 bbls. of 19.7 gravity clean oil from 4255 ft. after entering good oil sand at 4201 ft. Late in January of this year curtailed production was averaging 50 bbls. of 18.8 gravity oil cutting only 0.5 per cent.

Union Oil Starts Mount Poso Wildcat

Union Oil Co. moved a mile and three quarters west from Mount Poso production to spud Glide No. 1-7 in the southwest quarter of sec. 7,27-28. Last reported near 100 ft., the well seeks another of the small accumulations comprising the east Valley fields.

In sec. 32,26-28 Signal Petroleum Co. is abandoning Loudon No. 1 in gray sand at 1858 ft. after finding the Vedder barren.

After junking its 1320 ft. Elliott No. 1 in sec. 1,27-28 Alpha Oil Co. skidded rig 20 ft. northerly and is drilling No. 1A at 1050 ft. in hard rock. The old hole was reported to have entered Walker formation at 485 ft. and encountered the Granite near the 800 ft. mark.

Dudley Ridge Well Makes Small Gas Flow

Dudley Ridge Oil Co., Ltd.'s No. 3-16, in sec. 3,23-19 of Kings County, was plugged, perforated and finished flowing 200,000 cu. ft. of gas. Located east of the south tip of the Kettleman North Dome field, the well was bottomed at 1627 ft. and 5 in. casing cemented at 1200 ft. Testing wet on earlier intervals, the final plug was placed at 1197 ft. and the casing gun perforated at intervals below 1182 ft. where the gas flow resulted.

Richfield Plans Tulare Co. Well

Richfield Oil Corp. has located Tulare No. 1-1 in the southeast corner of sec. 33,19-24 of Tulare county. Situated only a mile northwest of the town of Tulare the wildcat will be the first to seek oil in the area. Only near prior drilling was Tulare Oil Co.'s 3200 ft. well in sec. 1,20-24 which was put down in 1922.

Some 19 miles south of here in the Pixley area, Continental Oil Co.'s Pixley Community No. 1 is drilling in undisclosed formations at 4793 ft. Located in sec. 9,23-25 the well also is testing a large heretofore untried area.

Lack of formation data on the current crop of wildcats can scarcely be considered unusual since successful wildcatting today will in all probability not be followed by intensive drilling development. Under these conditions the less competing operators know of the formation and test results, the easier it will be for the discovering operator to protect his strike acreage until conditions warrant an all out development program.

Richfield Drilling Grapevine Wildcat

Richfield Oil Corp. spudded its Grapevine-Wheeler Ridge wildcat in sec. 26,11-20 and was last reported at 1532 ft. The well is located a half mile west of the Ridge Route highway and approximately two miles southeast of the Wheeler Ridge oil field.

North Kern County Wildcats Continue

Near the northerly Kern County line and east of Delano in what is variously described as the Richgrove - Jasmine - Delano area, two wildcats continue with a third recently suspended.

In sec. 17,25-28 Wilshire Annex Oil Co. is testing oil sands in Amalgamated No. 1. Bottomed at 1152 ft. the well cored oil sand from 1104 to 1142 ft. which may be the objective Pyramid sands.

Shell Oil Co.'s Curry No. 1 in sec. 20,25-26 was last reported in shale and gray sand at 6125 ft. after finding what is believed barren Vedder at 5395 ft.

R. S. Bolling's Quinn No. 3, in sec. 15,25-27, is idle after bailing dry at 2915 ft. A small amount of 10 gravity oil was recovered, but fluid entry was too slow to warrant installation of pumping equipment.

Two Work at Dyer Creek

One of two wells currently active in the Dyer Creek area of Kern county, Shell Oil Co.'s Smith Cairns No. 3 is coring ahead at 2439 ft. after failing production on extensive trials above 2332 ft. Located in sec. 11,26-27 the well sought production from the sands which the company proved productive in Smith No. 56-X-11 in late 1941. The Smith well, also in section 11, completed pumping 253 bbls. of 15 plus gravity oil from 18 ft. of Vedder sand above 2361 ft. The current try found the Vedder at 2307 ft. and ran liners for tests of three Vedder intervals at 2317 ft., 2325 ft. and 2332 ft. all of which recovered only water with a trace of oil. The third liner was pulled prior to the present deepening.

In sec. 2,26-27, next section north, Dyer Creek Oil Co. seeks production comparable to that found by Shell. Last reported at 300 ft. the well was standing with 13 in. casing cemented on bottom.

Tide Water Associated First Aid Training

Employees of the general offices of Tide Water Associated Oil Company in San Francisco are now enrolling for training in First Aid courses to be conducted by representatives of the American Red Cross according to an announcement made by Charles R. Brown, assistant to the president.

The courses, which are open to all employees, will consist of two classes weekly over a period of five weeks. Classes for women employes are being conducted from 5:30 to 7:30 p.m. Tuesday and Thursday nights with classes for men at the same hour Wednesday and Friday evenings. Additional classes will be organized to train employees who may subsequently enroll.

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Coastal District

Loma Grande Tests Bradley Area Well

With results so far showing fresh water and a fair amount of gas, Loma Grande Oil Co. is testing Corey No. 1 near Bradley in Monterey County. Started two years ago, the well was drilled to 4004 ft. in Miocene formations and is now being tested in the interval below the casing shoe at 3510 ft. The project is located in sec. 23,24s-10e.

Century Abandons Carpinteria Test

Century Oil Co. failed to obtain the expected heavy oil production in Hall Core Hole No. 1 at Carpinteria and has abandoned the project. Drilled to 715 ft., the hole encountered tar sands below 600 ft. and a 7 in. combination string was landed on bottom and cemented at 613 ft., the top of the perforated interval. When bailed dry, very little fluid entered the hole and the well was plugged to the surface and abandoned.

Field-McDuffie Well Tests Tar Horizon

Palmer-Stendel No. 13-1, the wildcat well being drilled by O. C. Field, Wm. C. McDuffie, et al, north of the old West Cat Canyon field, set casing at 2850 ft. and is making a production test of a heavy oil horizon in the Miocene from the shoe to bottom at 3435 ft. After hanging a perforated liner at 3354 ft., the fluid was bailed to 2700 ft. but showed no rise. On attempting to run the bailer to bottom, the hole was found bridged with heavy tar at 2850 ft. so a quantity of distillate was introduced and bailing resumed. Continued runs of the bailer have resulted in the recovery of only a small quantity of the heavy stuff and it now appears that the well has little chance of becoming a commercial producer at present depth. Located in sec. 13, 9n-33w, the well passed from Sisquoc into Miocene at 2700 ft.

At the north end of the old shallow production at West Cat Canyon, Alphonzo E. Bell Corp. re-entered its 6377 ft. deep test, Gilmore No. 1 in sec. 23,9n-33w and is deepening at 6400 ft.

Lloyd Corp. to Deepen Ventura Avenue Well

Following the completion of Shell-Lloyd No. A-1 at 11,516 ft. as the deepest well in the Coastal area with an initial production of 2000 bbls. a day, Lloyd Corp. is preparing to deepen its first drilling venture, Lloyd Corp. No. 1. Located about 1000 ft. east of the Shell project, the No. 1 well was drilled as an exploratory well to 7487 ft. and abandoned nearly four years ago.

Alliance Petroleum Corp.'s Hisey No. 5, located in the north central portion of the field, is drilling below 9300 ft. and will soon be ready for completion as casing is already cemented at 8717 ft.

San Marino Resumes Bardsdale Activity

Resuming activities at Bardsdale, San Marino Oil Co. is preparing to recondition and possibly deepen

COASTAL COUNTIES WILDCATS

Santa Barbara County

Area	Well	No.	Section	Depth	Status
Cat Canyon	Alphonzo E. Bell Corp., Gilmore	1	23, 9-33	6385	Drilling
	O. C. Field & Wm. C. McDuffie et. al. Palmer-Stendel	13–1	13, 9-33	3435	Bailing
Carpinteria	Century Oil Co., C. H. Hall	1	34, 4-25	715	Abandoned
Casmalia	Dolly Adams Oil Co., Morganti	2	13, 9-35	1700	Idle
	O. C. Field Gas. Corp., Righetti	2	13, 9-35	2195	Pumping
Lompoc	Alphonzo E. Bell Corp., Lompoc	6	28, 8-34		Graded roads
	Fickert Oil Co., Ltd., Well	1	8, 7-33		Rig
Santa Maria	Roy Lee, Trustee, T.G.	1	33, 10-33	3503	Idle

Ventura County

Bardsdale	Hopland Oil Co., Well	1	1, 3-19	4634	Idle
	San Marino Oil Co., Cap. Crude	1	7, 3-19	1868	Rigging up
	Ventura Southern Oil Co.	G–1	19, 3-19	2296	Drilling
Conejo	Sycamore Oil Co., Boylan	1	23, 1-20	1700	Idle
Ojai	Coates, Spencer D., Pirie	5	7, 4-22	360	Drilling
	Kelalee Pet. Co., Harvey	1	8, 4-21		Rig
	Richfield Oil Corp., Ojai	44	13, 4-22	6537	Drilling
Oxnard	Signal Pet. Co., Well	1	36, 1-22		Location
Piru	Delroy Pet. Corp., Lisk Core Hole	1	22, 5-18	450	Drilling
	Pacific Western Oil Co., Temescal	11	4, 4-18	1279	Drilling
Sespe	Alford Drlg. & Expl. Co., Goodenough	1	18, 4-19	2581	Idle
	Ivers, H. A., Kentuck	13½	1, 4-20	1300	Drilling
	Highland Drilling Co., Cosby	1	14, 4-19	1986	Drilling
Timber Canyon	Denison, A. T., Denison	1	13, 4-21	1157	Idle
	Crude Oils, Inc., West	1	19, 4-20	958	Idle
	Henderson-Ortez Oil Co., O'Leary	1	29, 4-20		Rig

NORTHERN COUNTIES WILDCATS

County	Well	No.	Section	Depth	Status
Colusa	Pacific National Pet. Corp.	1	17, 17n-4w	1400	Resuming
Contra Costa	Faria, Joseph Jr., Faria	1	22, 2n-1w		Location
Madera	Blake, T. E., Chuck	1	28, 10s-17e		Rig
	Shell Oil Co., Inc., Chowchilla	6–18	18, 10s-14e	2723	Idle
Monterey	Loma Grande Oil Co., Corey	1	23, 24s-10e	4004	Swabbing
San Joaquin	Westates Pet. Corp., Spence	1	22, 1s-7e		Grading
	Standard Oil Co., West Coast Life	2	4, 1n-5e	5306	Abandoned
	Standard Oil Co., Blewett Comm.	3	23, 3s-6e		Rig
Stanislaus	Don Pedro Oil Co., Newman	1	9, 6s-9e	1906	Cleaning out
Sutter	Buttes Oilfields, Inc., Buttes	7	3, 15n-1e	5010	Idle
	Buttes Oilfields, Inc., Buttes	8	28, 16n-2e	5507	Drilling
Yuba	Wright, L. G., Cox	1	18, 14n-5e	1805	Cleaning out

Capital Crude No. 1 in sec. 7,3n-19w. The well came in from 1860 ft. last summer while pulling drill pipe and has since been flowing a few barrels daily through the drill pipe. Recently the well was killed, the pipe pulled and the hole cleaned out to 1200 ft. where a blow out occurred. At the present time, heavier equipment is being installed to continue the work. After recompleting Capital Crude No. 1, the company plans to drill Elkins No. 1 in the same section.

In Grimes Canyon near Bardsdale, Ventura Southern Oil Co. is coring diatomaceous shale at 2300 ft. after topping Miocene at approximately 1600 ft.

Richfield Drills Ojai Deep Project

Now below 6550 ft., Richfield Oil Corp.'s Ojai No. 44 is fast becoming one of the deepest wildcat wells drilled in the Ojai district of Ventura county. Formation still is steeply dipping Miocene brown shale with occasional inconsequential oil and gas showings. The project is located near old shallow production in sec. 13,4n-22w.

Signal Pet. Plans Oxnard Test Well

Signal Petroleum Co. of California is planning to drill a wildcat well on the Oxnard Plain approximately three miles southeast of Hueneme. The Wiltfong property has tentatively been chosen as site for the test. Objective of the try is the top of the Miocene which should be encountered near the 2000 ft. level at this location according to geological data gathered by the company.

C. C. M. O. to Drill Super Deep Test

Not content with the results of two 10,000 ft. wells, Chanslor-Canfield Midway Oil Co. is planning to drill a super deep test of the Rincon field. Believing that productive sands may be encountered at the base of the Santa Margarita, C. C. M. O. is contemplating carrying its next effort, Hobson No. C-10, as deep as necessary to tell a complete story. Geologists who have studied the field estimate such a test would probably have to drill to around 14,000 ft. Location has been graded near the Highway on the south flank of the field 1970 ft. south and 1750 ft. west of the northeast corner of sec. 17,3n-24w.

In recent weeks, C. C. M. O. Co. has been quite successful in reconditioning some of its old shallow producers.

Highland Deepens Hopper Canyon Well

Resuming operations at Hopper Canyon, Highland Drilling Co. is deepening Cosby No. 1 in sec. 14, 4n-19w. Last reported below 2000 ft., more than 80 ft. of new hole had been made.

Signal Petroleum Co. of California is reconditioning a number of old wells in Hopper Canyon on recently acquired properties which total approximately 700 acres.

Fritz Taves Joins Navy

Fritz Taves obtained a leave of absence from his post with California division of Schlumberger Well Surveying Co. upon being ordered to active duty with the United States Navy. He holds a Naval Reserve commission as Lieutenant Commander.

Fritz Taves

Mr. Taves, who was in the Army Air Corps during the last war, is well known to the California oil industry having become associated with E. J. Miley shortly after his graduation from the University of California in 1922. He later held petroleum engineering positions with Richfield Oil Corp. and the Oil Umpire's organization. He joined the Schlumberger staff seven years ago. No newcomer to the sea, Fritz spent his summers in the merchant marine during his college days.

Bob Phillips

Bob Phillips, a former engineer for the State Division of Oil and Gas, has taken over Mr. Taves' duties for the duration. Bob became associated with the Schlumberger organization in 1937.

Activity in Fields Confined to Redrills

The effect of the famous M-68 order has been to practically confine work within proved fields to reconditioning and redrilling operations despite the enormous increase in the demand for certain types of crudes for vital war needs. Scattering exceptions have been granted such as that for a well in the Santa Maria field but no real relief can be expected until final reports have been submitted by committees now making surveys of individual fields for the Office of the Petroleum Coordinator.

Convert Tank Cars For L. P. G. Transport

Tank car companies have begun to convert a number of ordinary railroad tank cars into cars capable of transporting essential liquefied petroleum gases used in making 100-octane gasoline and other war products, it was reported to Petroleum Coordinator Harold L. Ickes.

A green light for the conversion program was given by the Interstate Commerce Commission, which approved the placing of the first experimental converted high-pressure car into service.

Experiments to convert ordinary tank cars into the high-pressure type were conducted at Coordinator Ickes' suggestion to help meet the demand for liquefied petroleum gases. Gases of special types are required for the manufacture of 100-octane gasoline and also are used extensively for heating purposes by war industries.

The first experimental converted car was approved by the Tank Car Committee of the Mechanical Division of the Association of American Railroads, which filed the petition with the Interstate Commerce Commission.

Three benefits to the war effort will result from the conversion program, Deputy Coordinator Ralph K. Davies said:

1. An adequate supply of tank cars will become available to meet current and potential transportation needs for liquefied petroleum gases, such as isobutane.

2. Tank cars that were transferred to haul isobutane and other essential products can again be used exclusively to transport propane and other higher-pressure liquefied petroleum gases that are also necessary to war industries.

3. Both the time and steel required to build new high-pressure cars can be used for other important war work.

Only 30 days were required to convert the first experimental car from an ordinary tank car into one that will carry liquefied petroleum gases. Hereafter, even less time will probably be required.

"Practically all the material necessary for this work is now on hand," Davies said. "The few materials not in stock are being obtained."

Cooperating in the experimental work were the Interstate Commerce Commission, the Association of American Railroads, car-building companies, and tank car owners.

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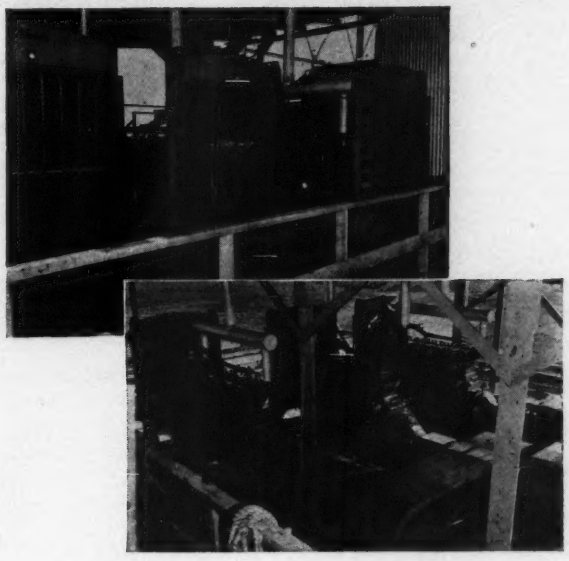

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Oil Men's Calendar

Calif. Natural Gasoline Association. Los Angeles Chapter—Meets 1st Thursday Each Month, Barker Bros. Bldg., Los Angeles—Dinner at 6:00 (Optional). Taft Chapter—Meets Third Thursday Each Month.

American Society of Mechanical Engineers—Los Angeles Section—Meets 2nd Thursday Each Month—Barker Bros. Bldg., Los Angeles. Dinner at 6:30 (Optional).

March

23-25—American Society of Mechanical Engineers, Spring Meeting, Houston, Tex.

23-25 — Western Petroleum Refiners Assn., 30th Annual Meeting, St. Charles Hotel, New Orleans, La.

26-27 — AMERICAN PETROLEUM INSTITUTE, Division of Production, Mid-Continent District, Spring Meeting, Mayo Hotel, Tulsa, Okla.

15-17—American Institute of Mining & Metallurgical Engineers, Cincinnati, Ohio.

16-17—National Petroleum Assn., 39th Semi-Annual Meeting, Hotel Cleveland, Cleveland, Ohio.

21-24—American Association of Petroleum Geologists, 27th Annual Meeting, Cosmopolitan Hotel, Denver, Colo.

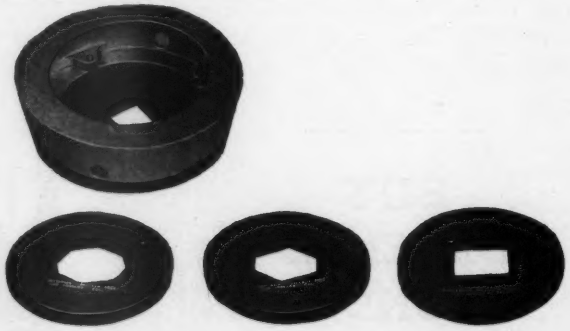
May

11-13—American Institute of Chemical Engineers, Boston, Mass.

13-15—Natural Gasoline Assn. of America, Mayo Hotel, Tulsa, Okla.

25-28—National Association of Purchasing Agents (Oil Company Buyers' Group), Waldorf-Astoria Hotel, New York.

25-28 — AMERICAN PETROLEUM INSTITUTE, 12th Mid-Year Meeting, Oklahoma Biltmore Hotel, Oklahoma City, Okla.

New Series of Kelly Wipers

In order to provide an effective Kelly Wiper to clean the Kelly as it comes through the Kelly bushing, Patterson-Ballagh engineers have introduced several new types of rubber wipers. These now include octagonal and hexagonal Kelly Wipers as well as the conventional square. Fittings have been developed for installation in Baash-Ross and Emsco types of Kellys. The rubber wiping unit is bolted at the bottom of the Kelly bushing and can be quickly removed for inspection. Arrangements can be made by purchasers of the bushings for installation of these wipers at the factories. Details are available from the manufacturers.